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EUROPEAN CIVIL AIR: Can NATO Count On It?

James W. Becker

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James W. Becker

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CONTENTS

Illustrations		x
Foreword		xi
Preface		xiii
Abbreviations		xvi
I.	**A CRISIS IN 1998**	1
	Pope Air Force Base, North Carolina	1
	Rhein Main, West Germany	4
II.	**EMERGENCY CIVIL AVIATION**	9
	US Civil Reserve Air Fleet (CRAF) Program	12
	CAPC and Intercontinental Lift	16
	CAPC, BOCCA, and Intra-Theater Lift	20
III.	**INTERCONTINENTAL CIVIL AIRLIFT**	27
	Cargo Aircraft Needed	32
	Modification of European Airplanes	34
	Will European Civil Air Be There?	37
	Away from "Home" Support	39
IV.	**INTRA-THEATER CIVIL AIRLIFT**	43
	Intra-Theater Airlift Up Close	44

European Civil Airlift—The Numbers 47
Intra-Theater Airlift Problems 50

V. **COMMON CONCERNS** 57
Airport Reception and Handling Capabilities 57
Air Traffic Control 58
Rapid Runway and Airfield Facilities Repair 60
Airlift of Hazardous Material 60
Willingness to Support 62
Key Civil Airlift Issues 63

VI. **IMPROVEMENTS IN INTER-CONTINENTAL AIRLIFT** 65
Increased Support Levels 66
Enhancement of Passenger Aircraft 66
In-Transit Support 67
Testing the Airlift System 68

VII. **NECESSARY MEASURES** 71
Issues Associated With the BOCCA 72
Issues Within the BOCCA 74
Will the BOCCA Work? 75

VIII. **IMPROVING INTRA-THEATER SUPPORT** 77
Determine the Status 77
Pre-Commit European Intra-Theater Civil Airlift 78
Strengthen the BOCCA 80

IX. **MORE COMMON CONCERNS** 83
Airfield Handling and Reception Capabilities 83

Air Traffic Control 84
Rapid Airfield Facilities and Runway Repair 84
Airlift of Hazardous Material 85
Summary 85

Endnotes 89

The Author 91

ILLUSTRATIONS

Figure

2:1 NATO Civil Emergency Planning Structure 10

Tables

2:1 Peacetime Emergency Planning Committees and Boards and NATO Civil Wartime Agencies 22
3:1 NATO European Civil Aircraft (Inter-Continental) 29
3:2 Aircraft Probably Available for NATO Reinforcement 31
3:3 US CRAF Stage III—Long-Range Aircraft by Type 32
9:1 Summary of Conclusions and Recommendations 87

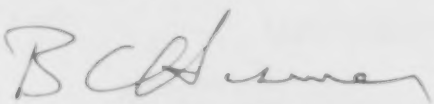
FOREWORD

Can NATO count on European civil aviation assets in the event of a crisis? This is the central question James Becker poses in this probing essay. As he points out, the United States has had its Civil Reserve Air Fleet (CRAF) program for many years, but major planning for the use of European civil airplanes for military purposes has come about only since the late 1970s.

Using an imaginative scenario to depict how an emergency in Europe might be met by employing both United States and European civil aviation, the author explores the likelihood of that use happening, especially in Europe. One great shortcoming, Becker argues, is that cargo aircraft are not as readily available in Europe as in the United States. Becker also explores other issues related to use of civil air in emergencies, areas such as airport reception and handling capabilities, air traffic control, rapid airfield facilities and runway repair, and the handling of hazardous materials.

Becker concludes that amazing progress has been made in NATO's ability to rely on Europe's civil aviation assets, progress he attributes to the dedicated efforts of both the NATO headquarters staff and individual country representatives to NATO's Civil Aviation Planning Committee. More progress must be made, however, and Becker suggests where and how to

do so. His personal viewpoints illuminate a planning area not widely understood but of potentially vital significance for NATO security.



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PREFACE

The use of civil air for military purposes, both in peacetime and in times of tension or war, is inherent in the plans and operations of most North Atlantic Treaty Organization (NATO) countries. The degree of reliance and, indeed, the legal claim on these commercial assets vary from nation to nation. However, a commonality of commitment for their use does exist and a system has been established to provide commercial airlift support across national boundaries should NATO be required to defend itself.

This essay reviews the various arrangements that are in effect for the use of European civil airlift, to include an exploration into the functioning of NATO's Civil Aviation Planning Committee and one of its wartime crisis elements, the Bureau of Coordination for Civil Aviation (BOCCA). Although the data used in the essay dates to the period of my research, it is still relevant, as no significant changes have occurred since its collection. Much of the information was extracted from interviews where non-attribution was agreed. A more in-depth revelation of background data would have meant the publication of a classified document. Hence, the essay, in its current form, represents a compromise between a large, detailed, classified report and what is believed to be a readable product available to all interested readers.

As an added thought, I found few military planners who were familiar with the workings of the NATO

airlift system. Only those dedicated movement planners in isolated joint or national airlift-related cells had a basic grasp of its potential, and, indeed, of the NATO system and the plans for the use of European civil air assets in a crisis. Therefore, while this document raises a number of concerns about the NATO airlift system, it also provides a basic description of the possible use of European civil airlift assets in a crisis. It is, therefore, believed to have value simply as an information piece even if the reader is not in agreement with my conclusions.

JAMES W. BECKER

European Civil Air:
Can NATO Count On It?

Abbreviations

ACE—Allied Command Europe

BOCCA—Bureau of Coordination for Civil Aviation (NATO)

CAPC—Civil Aviation Planning Committee (NATO)

CRAF—United States Civil Reserve Air Fleet

NATO—North Atlantic Treaty Organization

NCAA—NATO Civil Aviation Agency

NCAB—NATO Civil Aviation Board

SCEPC—Senior Civil Emergency Planning Committee (NATO)

I. A CRISIS IN 1998

Will NATO be able to count on having sufficient civil aviation aircraft capability, both European and United States, if a potential conflict threatens to erupt in Europe? Will civilian planes mesh with military aircraft in performing airlift missions? Let's take a brief, hypothetical look at how it is hoped (and planned) that civil airlift resources could meet such a crisis.

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26 OCTOBER 1998, POPE AIR FORCE BASE, NORTH CAROLINA

A frenetic pace of activity marks this chilly wind-swept autumn day at Pope. Troops carrying rifles and packs hastily climb portable steps into the huge Air Force C-5 Galaxy. Unable to be heard above the noise, an Air Force sergeant hurries his crew along to anchor the last Bradley fighting vehicle into its flight-safe position inside the aircraft.

Lined up directly behind the C-5 is a Pan American Airways Boeing 747 accepting palletized military cargo through its cargo side door. A forklift races between a line of pre-staged pallets and the Pan Am airplane while a large mechanical loader places the netted pallets onto the rollerized aircraft floor. Busy figures inside the 747 grapple with the pallets and attempt to position and tie them down for a transatlantic flight. The

orderly but intense pace has a seriousness above that normally associated with an airlift exercise. A quick check with one of the young Army privates in the troop line gets the response that they weren't sure where they were going but that this time it was the real thing.

What the private did not know was that the Council of the North Atlantic Treaty Organization (NATO) had decided to rapidly reinforce the European Continent. The NATO Council took action after the East-West situation deteriorated to the point where an all-out war was probable. Both Warsaw Pact and NATO countries had mobilized their forces. The movement of large Soviet logistical elements into East Germany and Czechoslovakia along with a repositioning of major armor and mechanized infantry units close to the borders signaled impending conflict. Forgotten now were such recent irrational incidents as the downing of a West German leisure aircraft that strayed too close to the East German border and the deliberate strafing and sinking of a Norwegian fishing boat clearly in international waters. Forgotten, too, were the repeated attacks by Soviet aircraft against American merchant ships in the Eastern Mediterranean. Bigger things were happening.

Natural gas had stopped flowing through the Soviet pipeline to Western Europe, shut off by an order from Moscow. Transit visas to or from West Berlin were no longer requested because they were automatically denied. West Berlin had, in fact, reverted to its 1948 status with one exception: any Western flight to Berlin would be shot down by Soviet fighters, or ground antiaircraft batteries, whichever could do it more efficiently. It was only a matter of hours before the Western Powers would need to decide to defend Berlin militarily or, if strategy

dictated, sacrifice Berlin to concentrate efforts on the broader European front.

The Army private from Fort Bragg was accurate with his assessment: this time it was the real thing.

Against this background of activity with global consequences, planes continued to arrive at and depart from Pope Air Force Base at record pace. Each carried a capacity load of soldiers or equipment. Both military and civilian aircraft took part, the latter pressed into service under the long-standing provisions of the United States Civil Reserve Air Fleet (CRAF). In fact, in the last 24 hours of activity at Pope, planes from almost all of the US air carriers flew in and out—both those normally in scheduled service, such as Pan Am or TWA, and such lesser known carriers as Global or Evergreen.

Because of this extraordinary level of activity, few of the air base ground personnel or soldiers awaiting movement even bothered to look at the next arriving aircraft. Though obviously a 747, until the jet came to a complete halt in the tight circle of aircraft receiving cargo and soldiers, no one noticed the difference between this one and those before it. This aircraft carried markings never before seen at Pope Air Force Base. It was a Sabena 747, more comfortable in the surroundings of Brussels, Kennedy or O'Hare Airports than at a US military airfield. Nevertheless, it was here at Pope, and its purpose seemed to be the same as its American 747 cousins—to take on cargo or soldiers.

Considerably confused about the Sabena 747, the sergeant, who had finished supervising the loading of the Pan Am 747, and a C-141 since then, now stood in some bewilderment. While his crew observed with obvious curiosity, he finally contacted the operations center,

only to be told that this airplane, like its predecessors, was to take on cargo from the long line of pre-staged pallets. However, it, unlike the Pan Am 747, was a "Combi," or combination aircraft: its front section configured for personnel and its rear half prepared to receive cargo pallets. This Belgian jet, the sergeant learned, was to receive soldiers as well as cargo pallets.

Some four hours later the huge plane, fully loaded with soldiers and cargo, lumbered down the runway at Pope and finally settled into the now darkened skies of North Carolina. The sergeant watched the takeoff with some remaining curiosity but also with a heightened satisfaction at participating in this unexpected effort of free-world cooperation.

Our hard-working sergeant did not anticipate the cooperative use of aircraft from other countries; nor did the other Army and the Air Force personnel at Pope Air Base. However, it was not a chance happening. More foreign aircraft would be seen at Pope as well as at other American air bases. Some would be L-1011s and DC-10s while other B-747s, configured for either cargo or passengers or both, would also be used. These foreign aircraft would be from many of the countries of the NATO Alliance, not just Belgium.

27 OCTOBER 1998, RHEIN MAIN, WEST GERMANY

If Pope Air Force Base was busy, then Rhein Main was pandemonium. The arrivals and departures of aircraft at this commercial and military air base were phenomenal. The mixture of airplanes was complex. Propeller-driven C-130s, from the United States and other NATO countries, were mixed in with sleek L-1011s, 707s, and 747s from every country of the NATO Alliance.

Across the airport, opposite the military air base, non-combatants were being evacuated through the international terminal. Almost every aircraft, military or civilian, going in the direction of the United States was full of American families, nonessential civilian employees, and tourists who had not heeded earlier warnings to avoid travel to Europe. The process was orderly despite the large number of evacuees. The cooperation among families—their sponsors long since deployed to secretive staging areas—was heartwarming. The biggest consternation came early in the evacuation when families learned that their pets would have to remain behind. The ensuing ruckus quickly caused the aerial port personnel to turn their heads as pet carrier after pet carrier was processed.

On the military side of the airport, cargo and personnel arrived at a rate and in quantities that easily compared to Berlin's Templehof Airport in the crisis of 1948. Large forklifts took the cargo from the ground and from rollerized pallet docks and placed it on large flatbed trucks from the Army's 37th Transportation Group and on the militarized civilian trucks recently pressed into service. Buses and smaller trucks took soldiers and airmen to staging areas and processing points in unprecedented quantities and with unprecedented speed. Clearly, this was the forward edge of war.

With the arrivals and departures of so many aircraft, few noticed those departing with war materials. The only onloading, until now, seemed to be the non-combatants leaving through the international terminal. Checking closely, though, you could see a small but diligent cargo onloading operation at the far end of the apron on the airport's military side. Here, too, there was

a mix of airplanes. A US C-130 had just completed taking on a full load of cargo pallets and was slowly moving away toward the flight line. The loading operation had already switched to an Italian Alitalia DC-9, a much different airplane from the C-130. But both planes carried similar cargo. This cargo came from the same pallet line and was destined for the same United States forces deployed in the far northern part of Norway. The Alitalia airplane was not the first European aircraft to load at this spot and with US cargo. Yesterday two Dutch DC-8s had come and gone, and later today a Belgian 707 would do the same.

Having completed loading, the Alitalia pilot taxied his aircraft to the rear of the queue for airplanes awaiting takeoff. As he waited, he wondered if his efforts and those of his fellow aviators from the other NATO countries would be of any help. Could they contribute enough aircraft to make a difference? Knowing, too, that most of the airplanes were designed for passenger travel, the pilot also wondered if there were sufficient quantities of airplanes in the right configuration. Cargo lift seemed to be the problem, the obvious rows of air cargo pallets stacked on the Rhein Main ready line being one indicator. Talking to other civilian pilots while waiting for his aircraft to be loaded, he discovered that the major support request was for cargo movement.

Finally lifting off, the Alitalia pilot directed his aircraft to cruising altitude and set the course for his northern Norway destination. With the copilot at the controls, the pilot again had an opportunity to reflect on the entire situation. He knew that war was imminent, and, deep down, knew also that he was willing to contribute whatever was required to support the NATO effort. He hoped that his fellow civilian pilots shared this

view. From what he had seen at Rhein Main they did. In conversing, they all spoke of their families and their hopes and prayers for their safety. They spoke of a need for a NATO community that was willing to stand united against a common foe, and they addressed some of the current thoughts on why the Warsaw Pact was making its warlike movements. Theories ranged from Eastern Bloc paranoia to the thought that Warsaw Pact leadership needed to develop an outside enemy in order to generate internal political support. Finally, concluding that regardless of the source of the probable conflict the situation was extremely serious, the pilots turned to discussing their individual roles.

The Alitalia pilot was surprised to learn from a Sabena 747 pilot that the Sabena aircraft had just arrived from the United States with a combined load of soldiers and cargo. He was even more surprised to find out that the Belgian support was provided under a long-standing US-Belgian bilateral agreement worked out by some unheard of NATO agency. The Sabena pilot thought that other European NATO countries also had similar agreements with the United States, but he was not sure of the extent or the specific arrangements. He was aware that the airplane he piloted to Europe from the United States was already being readied for a return trip there.

Talking to a Dutch pilot, the Alitalia pilot heard the same thing. The Dutch pilot, too, had just arrived from the United States with a load of US military cargo. That support, also, was being given under NATO guidance with specific arrangements worked out by the United States and the Netherlands. Other European civil aircraft, like his own DC-9, were being routed to destinations within Europe.

These intra-European or intra-theater commitments didn't seem to involve bilateral agreements or pre-committed assets, but like his current Norway mission, were being generated under some sort of on-call procedure with a NATO Board making the basic arrangements as need demanded. Here again, the Alitalia pilot was uncertain about how this system worked. He knew, in his own case, that Alitalia had responded quickly to the request for civil aircraft assistance; yet, he wondered if this latter system was really able to do the NATO allies any significant good.

The Alitalia pilot had just decided that there were many imponderables surrounding the use of Europe's civil aircraft to support any war effort, when his copilot questioned him about radio frequencies. The question may have roused him from his reflectiveness; however, it didn't drive away the awareness that there were many areas involved in the use of civil air assets for military purposes to which he did not have ready answers.

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In the situation that has been described, civil aviation worked well with military aircraft, and a steady stream of soldiers and supplies was on its way to Europe. But, is this hypothetical scenario realistically achievable? Let's examine now what some of the problems of civil aircraft are, and how they can be worked out so that, should the need arise, NATO planners will be able to count on the use of civil aviation to supplement military capability.

In this essay, I will review the general history of the use of civil aviation airlift capability to augment military planes, look closely at evolving plans and organizations for using European civil planes, and suggest ways to improve this mixed use of military and civil aircraft.

II. EMERGENCY CIVIL AVIATION

Because of relatively new developments, the Alitalia pilot's questions about the use of civil aviation to support military missions, specifically the use of European civil aircraft for these purposes, are reasonable. The United States has had its Civil Reserve Air Fleet (CRAF) program for many years, but major planning for the use of European civil airplanes for military purposes has come about only since the late 1970s. Some of the procedures are still being developed, which explains the pilot's general lack of information. For the most part, only those personnel closely associated with the use of Europe's civil aircraft are currently aware of these efforts.

Planning for the use of civil air assets by NATO, both for assistance in airlifting troops and equipment to the European continent and for intra-theater lift, is done by NATO's Civil Aviation Planning Committee (CAPC). The CAPC is one of the civil emergency committees subordinate to NATO's Senior Civil Emergency Planning Committee (SCEPC).[1] The overall relationships in the organization are illustrated in figure 2:1.

Because CAPC is a civil planning committee and falls, organizationally, under the NATO civil structure, its goal is to plan for the management and use of civil, not military, aviation assets that belong to NATO

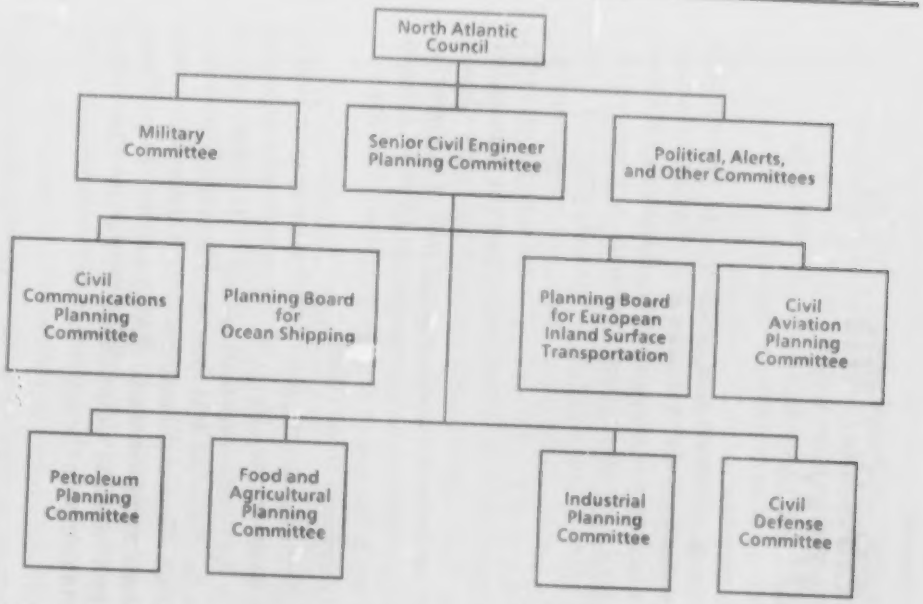
North Atlantic Council
Military Committee
Senior Civil Engineer Planning Committee
Political, Alerts, and Other Committees
Civil Communications Planning Committee
Planning Board for Ocean Shipping
Planning Board for European Inland Surface Transportation
Civil Aviation Planning Committee
Petroleum Planning Committee
Food and Agricultural Planning Committee
Industrial Planning Committee
Civil Defense Committee

Figure 1. NATO CIVIL EMERGENCY PLANNING STRUCTURE

SOURCE: The North Atlantic Treaty : Facts and Figures, NATO Information Service, Brussels, 1981, p. 157.

member nations. The CAPC is defense-oriented and plans for civil aircraft usage in defense crisis situations. For a long time thought of only as a "sleeping committee," the CAPC came alive in the late 1970s and early 1980s when planning for use of European civil air assets to assist in the reinforcement of Europe began in earnest.[2] Since then the committee has become a significant factor in planning for civil airlift to support NATO military requirements as well as supporting Alliance member civil requirements, when needed.

Membership on the CAPC, as with the other civil planning committees, includes all 16 NATO member nations, although Iceland and Spain have not been active participants. The CAPC functions much as any other NATO committee. A chairman is selected from one of the member countries (usually the country that last provided the vice-chairman). Meetings are held twice a year with published minutes supplied both in English and in French. Plenary committee decisions require a unanimous—not just a majority—vote. A variety of technical working groups and ad hoc committees investigate specific problems and provide recommendations. These subcommittees receive a variety of Alliance-member support depending upon the subjects under review and the airlift experts available from the various countries. Meeting frequency for the working groups and subcommittees accommodates the desires of the participants and the nature of the problem.

The two major areas under review by the CAPC are the use of non-US Alliance member civil air assets in the event of a European reinforcement, as we saw at

Pope Air Force Base, and the development of a methodology for providing "on-call" civil aviation support between countries, as described in the support being provided to transport US equipment from Rhein Main to northern Norway. The committee also addresses a number of ancillary issues related to the overall functioning of civil aviation in a NATO crisis-environment: civil aircraft safety, insurance, cargo and passenger tariffs, and reception capabilities. With two major areas to handle and the ancillary issues to pursue, the once "sleeping committee" has many reasons for keeping alert.

The awakening CAPC and its emphasis on planning to use civil aviation to support military actions coincide with and probably have their basis in the increased NATO thrust to ensure that Western Europe could be supported rapidly in the event of an impending crisis. The ability to place US troops and equipment speedily on the European continent is a major deterrent to a war in Europe. Specific actions by the CAPC to plan for the use of civil air may appear to parallel the example set in the United States where civilian aircraft are quickly switched to a military support role during contingencies. This program, familiar to most mobility planners, is the Civil Reserve Air Fleet (CRAF).

US CIVIL RESERVE AIR FLEET (CRAF) PROGRAM

Political considerations aside, dependency upon US civil air assets by strategic airlift planners is, in large part, subject to personnel and monetary considerations. Financially, maintaining enough military

assets to meet all US contingency and mobilization requirements would be an overwhelming burden. But, because the United States has a large quantity of assets in the private sector suitable for military airlift, using them to augment military capabilities reduces peacetime military costs.

Moreover, recent history justifies some of the reasons for US dependence on civil aviation. During the initial stages of World War II, the United States depended upon commercial air carriers for over 85 percent of its airlift.[3] During the Berlin crisis of 1948, while military airplanes flew the round-the-clock sorties from Wiesbaden and Rhein Main to Berlin's Templehof Airport, US commercial carriers took up much of the slack for military requirements elsewhere in the world. At the outbreak of the Korean War, the Military Air Transport Service (later the Military Airlift Command) immediately contracted for 66 civilian aircraft and later another 100.[4] This type of reliance on civilian support continued through the Vietnam War and continues now.

Originally no formal methodology governed the use of civil aircraft. None came until 1951, when President Truman's Executive Order #10219 charged the Department of Commerce to formulate plans to use civil aviation to help meet emergency needs. A memorandum of understanding between the Department of Defense (DOD) and the Department of Commerce implemented the order. In 1952, DOD published a plan to formally establish the Civil Reserve Air Fleet.[5] Essentially, the CRAF program commits US air carriers to augment US military airlift requirements during contingencies or mobilization. Incentives for the airlines

to participate include awarding Military Airlift Command contracts in almost direct proportion to their commitment to CRAF. In particular, each carrier shares the annual military airlift business according to the number and types of aircraft it offers to CRAF.

Basically, CRAF has had only two changes since its inception. The first was in 1963 when a memorandum between the Department of Defense and the Department of Commerce outlined three levels of CRAF employment, technically called CRAF Stages.[6] At each stage, a predetermined number of aircraft are available under a variety of conditions and authorities. Stages I and II cover something less than an all-out crisis and can be implemented without significantly affecting normal civil air carrier scheduled activities. Stage III applies primarily to total national emergencies and calls for carriers to commit all available long-range CRAF-designated aircraft; however, a declared national emergency is not necessary to activate CRAF Stage III.[7]

The second change affecting the CRAF program occurred in 1969 when the CRAF responsibility was transferred from the Department of Commerce to the Department of Transportation, where it remains today.[8] The relationship between the Department of Transportation (DOT) and the Department of Defense follows the previous Defense-Commerce arrangement. DOT has a major responsibility to allocate the civil air resources to the different and potentially competing national needs. Within DOD, the Military Airlift Command has primary responsibility for coordinating the CRAF program with commercial carriers and for

incorporating CRAF capabilities into contingency and mobilization airlift planning.

Currently, DOD is seeking congressional support to fund programs to enhance the cargo capabilities of the US civilian air carriers. The basic problem is simple: a far greater number of passenger, rather than cargo, airplanes exist to support military contingency requirements. For ten years DOD has requested federal funding to pay civilian air carriers to modify a portion of their passenger airplanes. Modified planes could convert to cargo aircraft at a moment's notice. Of course, a carrier must pull such planes out of regular service to modify them. Once modified, the carrier incurs more costs because of increased weight. The combination of these costs and a congressional concern that the money may not be well spent has weakened the enhancement program.

More successful are recent attempts to enhance the cargo carrying capabilities of CRAF planes. Congress had just passed limited legislation to reimburse carriers for modification and operation costs. Pan Am received a contract in September 1983 to modify a B-747 and up to 18 additional aircraft at an average cost of $26.7 million (1983 dollars).[9] The first modified aircraft entered service in May 1985. Thirteen additional aircraft have now been funded. So far, only Pan Am is involved but strong efforts to expand involvement continue. Adding cargo airlift capability in this manner makes good sense, especially when compared to the cost of building and operating new military aircraft.

Overall, the US CRAF program offers a conceptual model for using European civil aircraft to support NATO contingencies. CRAF developed out of a national need to be able to use civil airlift capabilities on

short notice. Historically, civil air support has been an integral part of US contingency programs. How much, if any, of the concept could be adapted to European civil lift remains to be seen. For the European NATO nations, internal politics and economics make any program similar to the US CRAF effort a far more complex issue than in the United States. Therefore, implementing such a European program fully is doubtful. What is important, however, is that some European aircraft are now available for NATO contingencies.

CAPC AND INTERCONTINENTAL LIFT

Pinpointing just when the idea started of using European civil air assets in the reinforcement of Europe is difficult. The problem naturally fell to the CAPC for development. US planners long foresaw a serious shortfall in strategic cargo airlift. The shortfall became particularly acute with the advent of the rapid reinforcement concept, leading in the 1970s to significant steps to improve US posture. Levels of pre-positioned reserves have been raised. Complete unit equipment sets were placed into active European storage, ready for use by fresh American soldiers when airlifted in the event of hostilities. Programs to improve military airlift capabilities were ultimately funded by Congress. Among them were the "stretch" of the US Air Force's C-141 Starlifter and a wing modification to the C-5 Galaxy. Both programs achieved their goals and significantly increased military airlift capabilities.[10]

Despite these programs, US cargo airlift ability is still insufficient. This would be critical if forces were simultaneously required in NATO and non-NATO

areas. An involvement in Southwest Asia, for example, would drain airlift assets and quickly reduce the ability to respond to NATO needs. Given its stated role in civil emergency planning, the CAPC considered the civil aviation issue in the context of an overall NATO commitment to resolving problems of mutual security interests.

CAPC acts slowly and methodically to grapple with the problems of arranging non-US NATO civil airlift to help reduce the intercontinental shortfall. Yet, with only two meetings each year and no permanent staff to manage and administer the effort, the CAPC has accomplished much. Starting in 1977, it established a technical working group to consider the reinforcement problem. Originally chaired by a Belgian and later an American, this technical working group initially devoted itself to determining aircraft availability and capacities, and to develop methods of employment. Some of the legal and monetary issues it first considered are still unresolved. Significantly, however, almost all of the NATO countries with intercontinental aircraft are committed, in principle, to supporting the effort. Moreover, the CAPC had the support, both from its senior committee, the Senior Civil Emergency Planning Committee (SCEPC), and from the North Atlantic Council, itself, to accomplish whatever would speed reinforcement of Europe in an East-West crisis.

As the senior US agency responsible for civilian airlift support and as the agency responsible for providing the US representative to the CAPC, the Department of Transportation has steadily coordinated with the NATO agency and has deeply involved the US Department of Defense by ensuring appropriate DOD

participation at CAPC itself, and at working group meetings. Within DOD, planning for the use of European civil aircraft in the reinforcement role belongs to the Military Airlift Command. In fact, the chairman of the technical working group concerned with the use of European civil air in the reinforcement role was the representative from MAC. Under his leadership, the committee made notable progress.

Although one could naturally assume some sort of European CRAF program or an overall country-by-country commitment to a NATO pool, such is not the case. Rather, in response to requests for commitment from the North Atlantic Council, nations politically committed themselves to providing airplanes. However, each nation still retains the authority to determine the constraints and procedures under which it will provide the support. Furthermore, once politically committed, the Supreme Allied Command, Europe (SACEUR) has to allocate resources to nations in need. Because of obvious reinforcement requirements, all support went to the United States. The United States and the concerned nations then established bilateral agreements for the use of the aircraft during a European reinforcement. The principal CAPC involvement was to set the stage and to develop the basic methodology. Having done that, CAPC left the basic responsibility for obtaining and using the aircraft to the United States and each individual country having committed aircraft to NATO. No pool of aircraft was ever established, no NATO CRAF program ever implemented. At the present time, once the aircraft are allocated and identified (in numbers by type of aircraft), bilateral arrangements govern the methodology for

use of the planes. These bilateral agreements detail such matters as support times, command and control procedures, communications, and other responsibilities.

Even with the bilateral agreements, though, the CAPC does stay involved. One major issue involving the commitment of civilian aircraft which is still being addressed by the CAPC is the question of liability insurance to provide reimbursement to the country or carrier in the event an aircraft is damaged or destroyed during a support mission. Liability will remain a problem. Some CAPC members believe the supported country should reimburse the country which lost the aircraft; the majority, however, appear to favor using NATO funds for any reimbursement. Even within the majority, though, differences still exist over an appropriate cost-sharing formula. The United States has steadily maintained that the burden for any losses should be split according to cost-sharing formulas now used to divide the costs for NATO overall. Other countries have presented variations on this theme. One nation strongly supports a formula dividing the burden according to each NATO country's gross national product. The latter formula would affect the United States and several other nations more than use of the basic NATO cost-sharing formula.

In a separate action, CAPC has determined compensation for use of an aircraft with general agreement on appropriate tariffs, by type of aircraft. Reviewed annually by a CAPC working group, these tariffs are updated, as necessary, and apply to both intercontinental and to intra-theater use of the airplanes.

In addition to liability and compensation issues, the CAPC must stay abreast of the use of civil aviation in the reinforcement role, despite its implementation through bilateral agreements. CAPC tracks overall commitment by nations to supporting the reinforcement objectives and the level of that commitment. And though it doesn't negotiate, CAPC keeps informed about actual bilateral agreements that are completed and signed. So while the CAPC is, in one sense, withdrawn from direct, active participation once the United States and an individual country have worked out an agreement, the CAPC still keeps itself involved enough to know what committed aircraft are ultimately covered by bilateral agreements.

Other issues affect directly or indirectly the ability of the NATO civil air carriers to support reinforcement, including such issues as air-space control; airfield reception capabilities; airfield damage and rapid facilities repair; covering runways; maintenance; and in-transit support. Since these issues also involve the intra-theater support role of civil air as well as civil aviation used in an intercontinental reinforcement role, they will be discussed in greater depth after a description of the intra-theater civil aviation support system envisioned for NATO.

CAPC, BOCCA AND INTRA-THEATER LIFT

Although the Alitalia pilot whose DC-9 was enroute to northern Norway wondered how his aircraft was picked for the mission, a NATO system built around one of CAPC's wartime crisis elements—the Bureau of Coordination for Civil Aviation (BOCCA, pronounced "BOW-KA")—manages the procedure.

Even knowing this, the pilot might still have questions about how the BOCCA functions and how it obtains civil aircraft for NATO's use.

As we saw when looking at the civil airlift support to Pope Air Force Base compared to the use of civil air at Rhein Main in Germany, the intra-theater lift originating at Rhein Main was not preplanned. No specific movement plans had been established for these aircraft nor was there any advance knowledge that a specific European civil aircraft would be available for the intra-theater mission. BOCCA operates in this arena to handle the unplanned or as-needed requirements, given aircraft availability and a willingness to support by the member countries.

To understand the BOCCA and its relationship to the CAPC one need only to look to NATO's civil wartime agency structure. All but one of the NATO peacetime planning committees has a related wartime agency that is activated during a crisis. The exception is the Civil Communications Planning Committee. Some variations do occur depending upon the organization and the geographical characteristics associated with a committee's responsibilities. For example, the NATO Planning Board for Ocean Shipping (a peacetime planning committee) has the NATO Defense Shipping Authority as its wartime agency. This agency coordinates regional shipping and container movement.[11] Table 2:1 lists all the NATO civil emergency planning committees and their associated wartime crisis elements.

The CAPC's wartime agency, the NATO Civil Aviation Agency (NCAA) has two elements: one element, the NATO Civil Aviation Board (NCAB), is composed of representatives from each of the member

Table 2:1.
Peacetime Emergency Planning and NATO Civil Wartime Agencies

Emergency Planning Committees	*Related Civil Wartime Agencies*
Food and Agricultural Planning Committee	Central Supplies Committee
Industrial Planning Committee Committee	Central Supplies
Petroleum Planning Committee Organization	Wartime Oil
Planning Board for Ocean Shipping Agency	Defence Shipping
Planning Board for European Inland Surface Transport Transport in Central Europe and in the Mediterranean	Inland Surface
Civil Aviation Planning Committee Agency	Civil Aviation
Civil Defence Committee	
Civil Communications Planning Committee	

Source: *The North Atlantic Treaty Organization: Facts and Figures*, NATO Information Service, Brussels, 1981, p. 38.

countries, and is essentially a policy group which the North Atlantic Council activates depending upon the issues arising at time of crisis. The second, and far more important, element is the BOCCA, the operational element. Without formal North Atlantic Council activation, the BOCCA springs to life through the NATO Alert System to meet crisis situations. Approximately thirty-five personnel, most of whom will be

civil aviation experts from the various countries, will be used when BOCCA is operational. They are pre-designated and assigned various roles within the BOCCA. Some of the members move into the BOCCA's wartime location when a crisis requiring management of civil aviation assets for NATO needs appears imminent.

Yet, even when activated, BOCCA will not assume operational responsibilities for employing NATO civil aircraft. Its role will be primarily, as its title indicates, a coordinating organization. The NATO "Facts and Figures" book which calls the BOCCA "an information center," provides a good description of those elements.[12] One NATO staff member who was interviewed spoke of BOCCA as a "broker of NATO civil aviation."[13] That organization also maintains a status report of civil airfields, any reception or handling problems and the general situation of NATO civil airlift capabilities. The BOCCA's basic function, however, is to coordinate on-call requests for the use of civil air assets.

How do these requests come about? Who can make a request for civil airlift support via the BOCCA? Both member nations and the Allied Command Europe (ACE) Airlift Cell can place requests to the BOCCA. In the case of member nations, the requests involve civil and not military requirements. For example, a nation experiencing difficulties in airlifting food products for its people could send a request directly to the BOCCA. Civil support, incidentally, was the original purpose for NATO's Civil Aviation Planning Committee and its crisis element, the Bureau of Coordination for Civil Aviation. For military support, NATO military channels task the SHAPE Airlift Element which, in turn, requests the BOCCA to arrange

civil airlift support. Generally, military requests for civil aviation will come only when military airlift assets either are not available or are being held for a more critical mission than the one for which civil assets are being sought. Regardless of the source of the request, once it is matched to a capability, the BOCCA will "marry-up" the two countries (supporter and supported). At that point, the BOCCA completes its basic coordinative, brokerage function. Operational control remains with the providing nation, and the BOCCA has no further direct tie to the mission. The user must effectively arrange the mission details.

With no definitive guideline for the type of aircraft BOCCA will arrange, nothing prohibits, or makes it responsible for, either intercontinental or intra-theater civil airlift. Before emphasis shifted toward using European civil airlift to move NATO personnel and equipment in a reinforcing role, the BOCCA was definitely intended to coordinate civil aviation for an intra-theater or an intercontinental role. If specific aircraft support, by country, in the reinforcement role is ever identified, the bilateral agreements to exercise it reduce BOCCA's role in arranging intercontinental military support. This is not to say that the BOCCA will not make some inter-continental arrangements, either for civil support or for military purposes. However, specific designation of intercontinental aircraft for reinforcement reduces the number of assets available and eliminates a major source of potential requests. The bilateral agreements are self-contained and are not dependent, operationally, on any element outside the two countries involved. Consequently, while not restricted technically to this role, the BOCCA will reorient itself toward arranging support for civil requirements and for military needs that

involve airlift over less than intercontinental distances.

Two different types of commitments should evolve from the BOCCA's efforts. The principal one is the one-time lift or sortie requirement, simply called a "mission" request. In arranging this type of support, the SHAPE Airlift Cell (or in the case of a civil request, the requesting nation) asks for aircraft support to fulfill a specific lift requirement, to move a quantity of troops from one point to another within a certain time, for example. Although expected infrequently, the second type of commitment involves requesting aircraft support for a specific period of time. Under this type of support, the country owning the civil airlift assets would make a set number of airplanes available to another country for a specific period. In both instances, the requests result from the wartime situation as it develops, not from any pre-planned lift. In each instance, too, the BOCCA handles the coordination.

In coordinating civil lift via the BOCCA, communication occurs among the ACE Airlift Cell, the individual Alliance members' National Civil Aviation Information Centers (NCAIC), and the BOCCA. Each NATO country has identified an element, normally within its transport ministry, as its civil aviation information center. Civilians normally man this center—not the country's military—and monitor the civil aviation assets of the country. Requests for civil support come from the NCAIC of a requesting country directly to the BOCCA which, in turn, directs the request to a country able to support it. Military requests move through SHAPE military airlift channels via the ACE Airlift Cell, which passes the request to the BOCCA. The BOCCA then handles the request in

the same manner as a civil request, sending it to the NCAIC of a nation that might meet the need. Once the basic arrangement is made, communications concerning commitments of the assets for military support pass between the military element of the requesting country and the national civilian information center. Communications regarding civil support ultimately take place between the applicable NCAICs of the supporting and the supported nations.

As the above description shows, the BOCCA does have a significant role in the coordination of civil aviation available in a NATO crisis. Because bilateral agreements govern the majority of the expected military uses of civil aviation in an intercontinental role, the BOCCA will be oriented toward coordinating shorter range, intra-theater airlift, especially that for military purposes. Both the BOCCA procedures and the planning for the reinforcement lift support come under the general peacetime responsibilities of the Civil Aviation Planning Committee. Despite the emphasis the Committee gives to the intercontinental lift problems and to the arrangement of the bilateral agreements, the CAPC is concerned about and has steadily worked to increase the effectiveness of its wartime crisis element, the BOCCA.

III. INTERCONTINENTAL CIVIL AIRLIFT

Given his direct operational involvement, the Alitalia pilot's lack of knowledge about the NATO civil airlift arena may seem unusual. His questions illustrate, though, the uncertainties concerning European civil airlift for NATO military support. Reviewing the intercontinental issues that have occupied much of the CAPC's attention over the last six or seven years gives a better understanding of this potential source of airlift support.

Even though this was agreed to in a North Atlantic Council plenary session, not all of the NATO European countries with an intercontinental civil lift capability have yet assigned airplanes. Some lack sufficient quantities of the necessary types of aircraft, especially cargo planes. The committed NATO countries have signed or are in the process of signing bilateral agreements to detail specific arrangements and procedures for using the aircraft. These nations say, at least on paper, they will provide the support. Yet, can we really believe they will do so?

Before assessing the likelihood of the support, we should decide whether this capability is significant. What is the potential number of intercontinental aircraft that could be available? Table 3:1 identifies, as of January 1985, the possible intercontinental assets, by

European NATO country, available for a NATO reinforcement.

Table 3:1 requires qualification, since the numbers continue to change. Many countries are phasing out the smaller aircraft, the B-707s and the DC-8s. Noise abatement laws, lack of fuel, load efficiencies, and the age of the aircraft mitigate against long-term future use. Moreover, aircraft constantly shift. Some of the airplanes are leased out to other countries—even to countries that are not part of NATO. For financial reasons, ownership of the aircraft also shifts on a periodic basis, including sales to third world or neutral countries, sometimes with leaseback arrangements. Because some of the carriers are reluctant to disclose financial maneuvers, there's no certain way to ensure that all the aircraft listed belong to or are always available to the country to which they are identified. Further, the table does not include assets from either the United States or Canada. Canada has withdrawn from any specific commitment to augmenting NATO reinforcement via direct NATO civil aircraft augmentation plans in favor of a coordinated United States-Canadian integrated line of communication agreement still being developed.

US civil aircraft are already committed to CRAF, and hence to European reinforcement. The assets of the French airlines are included in table 3:1; however, France's civil aircraft should not be counted upon in light of French desires not to commit resources to NATO military plans at this time. Because of their geographical locations and the intervening water and land masses, the United Kingdom and Portugal both will need reinforcing missions of their own. Therefore, one can assume that not all of their assets could be

Table 3:1.
NATO European Civil Aircraft (Intercontinental)

Country	*B-747 Pass*	*B-747 Cargo*	*B-747 Combi*	*DC-10 Pass*	*DC-10 Cargo*	*L-1011 Pass*	*B-707 DC-8 Pass*	*B-707 DC-8 Cargo*	*Concorde*
Belgium	0	0	2	0	5	0	1	3	0
Britain	30	0	0	10	0	17	8	10	7
Denmark	2	0	0	1	0	0	4	1	0
France	18	7	10	6	0	0	10	7	7
Germany	3	2	10	14	0	8	3	13	0
Greece	2	0	0	0	0	0	2	4	0
Iceland	0	0	0	0	0	0	2	1	0
Italy	5	1	3	3	0	0	0	0	0
Luxembourg	0	2	0	0	0	0	1	6	0
Holland	9	0	8	5	4	0	4	0	0
Norway	1	0	1	2	0	0	3	0	0
Portugal	1	0	0	0	0	5	5	3	0
Spain	6	0	0	9	0	0	4	5	0
Turkey	0	0	0	2	0	0	3	2	0
TOTALS	77	12	34	52	9	30	50	57	14

SOURCE: Compiled from the *1983/1984 Airline Handbook* and from data obtained during personal interviews.

made available for US reinforcement missions. Iceland has not been an active participant in the CAPC, and its assets should not be counted upon for any pre-planned missions. Spain's entry into NATO has not yet led to civil aircraft support. While the Spaniards might ultimately participate, they, too, cannot be counted on now for pre-planned intercontinental civil airplanes to support a NATO reinforcement. Taking France, Spain, and Iceland into account and assuming only a 50 percent participation rate from Portugal and the United Kingdom, an estimate of the remaining aircraft available, as of January 1985, for initial use in reinforcing Europe is set out in table 3:2.

One way to determine whether this quantity of aircraft is significant is to compare it to the United States CRAF Stage III quantities. How favorable the comparison is in terms of numbers emerges from reviewing the long-range international aircraft, by type, committed, as of January 1985, to CRAF Stage III. (See table 3:3.)

Comparing tables 3:2 and 3:3, the possible number of European aircraft for a NATO reinforcement is almost two-thirds the number of long-range international aircraft committed to CRAF Stage III. Though a greater percentage of wide-bodied aircraft appears in CRAF Stage III than in those potentially available from the European countries, the comparison does illustrate that the European NATO countries, combined, do have a significant civil airlift capability. This comparison is even more favorable to the European aircraft if some of the aircraft from France and Spain do, at some point, become available in the event of a major NATO crisis. France, especially, has significant airlift assets that would boost the quantities NATO can expect.

Table 3:2.
Aircraft Probably Available for NATO Reinforcement (Intercontinental)

Type of Aircraft	*Number of Aircraft*
B-747 Passenger	38
B-747 Cargo	5
B-747 Combi	24
DC-10 Passenger	32
DC-10 Cargo	9
L-1011 Passenger	19
B-707 Passenger	17
B-707 Cargo	30
DC-8 Passenger	11
DC-8 Cargo	6
Concorde	4
TOTAL	195

Summary:
89 wide-bodied passenger
14 wide-bodied cargo
24 wide-bodied combination
28 narrow-bodied passenger
36 narrow-bodied cargo
4 Concorde

SOURCE: Compiled from the *1983/1984 Airline Handbook* and from data obtained during personal interviews.

CARGO AIRCRAFT NEEDED

Despite the numbers presented, other considerations must be evaluated before concluding that the European civil aircraft can play a serious role in the

Table 3:3.
US CRAF Stage III—Long-Range Aircraft by Type

Type of Aircraft	*Number of Aircraft*
B-747 Passenger	112
B-747 Cargo	30
DC-10 Passenger	75
DC-10 Cargo	14
L-1011 Passenger	37
B-707 Passenger	0
B-707 Cargo	0
DC-8 Passenger	15
DC-8 Cargo	13
TOTAL	296

Summary:
224 wide-bodied passenger
44 wide-bodied cargo
15 narrow-bodied passenger
13 narrow-bodied cargo

SOURCE: *Civil Reserve Air Fleet Monthly Summary Sheet*, 1 May 1985.

reinforcement of Europe. One very obvious problem is whether significant cargo aircraft will be available. When comparing the wide-bodied capabilities listed in tables 3:2 and 3:3, we see that cargo aircraft are not prevalent in Europe. Another serious question is whether the commitment level will come anywhere near the capability of the European airlines. While the North Atlantic Council may have agreed to full support, some European countries might not be willing to pre-commit every available intercontinental air

asset to reinforcement. Most nations would want to retain some flexibility. Some of the former European colonial powers have strong ties to their former colonies, and a large number of European citizens still reside and work in those. These people may require air evacuation in the event of hostilities, especially in the event of hostilities as encompassing as those that would accompany a crisis requiring a NATO reinforcement. A good example of an evacuation situation was the multinational airlift and rescue effort in Zaire in May 1978. In that regional crisis over 2000 French and Belgian troops were airlifted into Zaire, and 2500 European evacuees were airlifted to Europe after Angolan-supported rebels captured a mining town in Zaire populated by Europeans.[14] In the Zaire operation, the combination of military and civilian aircraft included civil air assets from France and Belgium. This is but one example of why European countries may want to retain some civil airlift capability. In addition, such a mix would make possible some civil airline service right up to the point of a full-scale war. Airlift of strategic materials and supplies into Europe from external sources would also be enhanced.

Therefore, while a comparison of European civil aircraft to CRAF Stage III demonstrates that the European countries, indeed, have a significant civilian airlift capability, for political, economic, or regional stability reasons, it is unlikely that the European countries would initially commit all of their intercontinental assets to a European reinforcement. Yet, even if the numbers presented in table 3:3 are reduced by a "skepticism factor" of 25 percent due to this reluctance, the remaining aircraft still present a reasonable

lift capability, one that can provide much needed assistance to the United States in its role as a reinforcing NATO country.

The bigger problem than strictly numbers of airplanes is the number by aircraft type. The primary airlift shortfall, given a European war scenario, is in intercontinental/transoceanic cargo lift. The large sums of money spent on building and later modifying the C-5 airplanes, the stretching of the C-141s, and now the plans to enhance some of the US civil passenger airplanes so that they can be used for cargo operations all attest to the greater need for cargo rather than passenger airplanes. The summary of potential European civil aircraft (table 3:2) shows a significantly greater number of pure passenger aircraft, 121, than pure cargo airplanes, 52. Looking at the ratio for wide-bodied airplanes, we find 14 large pure-cargo airplanes compared to 89 large passenger aircraft. Additionally, there are 24 B-747 combination aircraft that offer some cargo capability. However, these comparisons show that the overall cargo capability is limited.

MODIFICATION OF EUROPEAN AIRPLANES

Why not modify European passenger aircraft for possible cargo use? Why not establish a European aircraft enhancement program similar to the one for US CRAF airplanes? Building cargo convertibility features into European passenger airplanes would surely increase European civil cargo capacities. However, when a CAPC technical working group examined this convertibility approach, it found resistance centered on the costs associated with such a program. All attempts to convince European governments and airlines to absorb costs themselves for convertibility

features in new aircraft have been unsuccessful. The convertibility features will have the same impact on a European airline as they do on a US carrier: aircraft construction or modification time increases; operating efficiencies decrease because of added weight and less passenger carrying capability. Given the highly competitive nature of the airline industry and the extremely difficult circumstances under which the industry has been operating—both in the United States and in Europe—few wonder that all the European airline companies, mainly nationally owned, fail to support an idea that would cost them additional funds. European nations won't likely ever come to a consensus on supporting the addition of cargo enhancement features in their civil passenger aircraft. That lack of consensus makes it even more unlikely that any country will unilaterally take such an action.

One other way to increase European aircraft cargo capabilities merits special attention—enhancing combination aircraft to enable them to carry pallet loads. The basic problem is that while the B-747 combination aircraft are designed to carry twelve or thirteen cargo pallets in the part of the aircraft identified for cargo, the majority of these airplanes have sufficient hardware to accommodate only six pallets. Two of the thirty-four combination aircraft listed in table 3:1 are currently in service with pallet kits that will accommodate only six or seven pallets. Additional kits are available, for roughly six more aircraft, but are currently not used. All in all, the availability of appropriate hardware would increase the total one-time lift capability to the equivalent of two B-747F aircraft devoted solely to cargo. With this sort of added capability, why not increase the cargo capacity simply by adding

the hardware? As with the enhancement program, the primary answer is cost, although in this instance, the cost of adding pallet hardware is much less than building enhancement features into airplanes. The cost in dollars to add one six-pallet set of hardware to a B-747 combination airplane is estimated at $420,000.[15] The total cost for this program is estimated to be about $11 million, a very cost effective project for the capability achieved.

Despite what appears to be a relatively inexpensive approach to adding some modest cargo capability, there is no apparent peacetime incentive for the European airlines to do so. In most cases, the current six-pallet configuration more than adequately provides the airlines the cargo capacity they require. The question then becomes, why not pay the airlines to buy and stock the hardware? This solution has its own set of problems, although the CAPC is reviewing this approach. One of the problems, as with the enhancement of the European passenger aircraft, is that there is no direct national incentive for a country to subsidize an airline to buy the pallet kits.

Because of reluctance to support a direct subsidy for this purpose, the CAPC is now pursuing the idea of using NATO infrastructure funds to buy and possibly store the hardware and to stock it at locations where it would be readily available to the airlines at a time of need. Even this approach is not without problems. Other critical factors are the costs of installation, estimated to be $20,000 per aircraft, and the method of financing these charges. Moreover, there is little precedent for using NATO infrastructure funds for equipment. Infrastructure funds normally go to

installations and facilities and not to mobile equipment items. This approach does avoid subsidizing a particular airline while placing hardware at the disposal of the airlines when it is needed. How these matters will be resolved remains to be seen. But to pass up this low-cost though modest improvement in cargo capability seems foolish.

From building in cargo convertibility features to the modest pallet hardware possibilities, the chances of significantly improving the cargo capabilities for the European passenger aircraft are small. Nevertheless, the use of European civil aircraft to support a NATO reinforcement has promise. Every European aircraft committed to the United States for European reinforcement, even if it is a passenger aircraft, does two significant things: it releases another US passenger aircraft for possible modification for cargo use and it lets the European countries help to ensure the outcome of their own fate by deepening their role in the active reinforcement of the European continent.

WILL EUROPEAN CIVIL AIR BE THERE?

The remaining part of the intercontinental question is, how reliable is the system for actually getting, managing, and supporting the intercontinental aircraft from Europe? If you recall, the commitment system is built around a series of bilateral agreements between supporting and supported countries. Are these agreements adequate? Are they viewed as binding by the supporting nations? Will they work?

Part of the answer to these questions is subjective. I believe that the support will be there when it is needed. From my interviews with military and civilian officials—both United States and European—it is

clear to me that the agreements, once signed, are sacred. No country that has signed an agreement has done so wearing blinders, nor has the system been sold overnight. Both system and procedures have been negotiated over a number of years, and any internal legal or operational constraints have been faced and either removed or resolved. The airline companies have been involved in the issue. The NATO alliance countries generally recognize that their own national interests are best served by speedily delivering reinforcing soldiers and equipment in the event of a major crisis. Peacetime costs are minimal unless cargo enhancement procedures are included, and therefore the peacetime impact on the various supporting countries does not preclude their support. As a consequence one of the basic ingredients to assuring the agreed-to inter-theater support is the commitment on the part of the countries and their airlines to meet their stated agreements.

Yet the mechanics of potential operation are untested. The agreements outline timeframes, general reporting locations, and command and control procedures. Many of these procedures are similar to normal airline operating procedures—perhaps more akin to an airline charter operation where an aircraft is given specific instructions on where to report and by what time. If any breakdown in operational procedures occurs, it will probably happen once an aircraft is returning to Europe under wartime conditions. Under normal conditions, the European carriers will be able to rely primarily on the commercial system. The aircraft providing the intercontinental support (B-747s, DC-10s, and others) are used on international and

often transatlantic flights. Their crews would be familiar with the navigational and communications procedures, maintenance and refueling methods, and general operating techniques. However, if the European continent becomes a hotbox of activity, with military aircraft control procedures overriding the civilian procedures, it will be more difficult for the civilian crews to respond because of changes and unfamiliarity. The aircraft will most likely be required to go into some military airfields, potentially some that have not had to handle planes like a DC-10 or a B-747. These changes and differences will all have some effect on the ability of the civil air carriers to operate in this environment.

AWAY FROM "HOME" SUPPORT

The ability to support the aircraft when they are flying outside their normal routes and servicing airports is a significant consideration. There are at least three possibilities for the airplanes to be serviced and, when necessary, to be provided maintenance when they are on extraordinary missions for the Military Airlift Command. First, their support could come from US military sources at locations that service US military aircraft. Another, and perhaps more likely second possibility, is for the aircraft to use the US CRAF Senior Lodger system,[16] a system agreed to by the major US international air carriers and one already on "standby." Under this, US air carriers located at specific airports assume the primary responsibility for refueling and servicing other US CRAF airplanes on a Military Airlift Command/CRAF related mission. Though not specifically a part of the agreement, European carriers could also receive support through the Senior Lodger system, when necessary. Finally, the

remaining support possibility is through host nation arrangements. Bilateral host nation agreements already exist with some countries for servicing and maintenance support during a European wartime crisis. European aircraft could expect the same support as their US allies when flying in direct support of the US Military Airlift Command.

Given the variety of servicing and in-transit maintenance possibilities, the European aircraft could receive support under one of these systems, in effect simply treating European aircraft as if they were US CRAF, or US military assets, when out of their own operational support network. Using this guideline would reduce in-transit support considerations to a minor problem.

The number of aircraft available and European commitment and possible support procedures indicate that the European civil aviation intercontinental airlift system is workable. The number of aircraft potentially available for use is significant and relates well to the number of aircraft available in Stage III of the CRAF program. The biggest problem is the lack of cargo aircraft since those few that are available would be quickly overcommitted. Efforts to build cargo conversion capabilities into NATO European passenger aircraft have not been supported, making any major progress in this area unlikely. Adding the necessary hardware to expand the combination B-747s from six- to twelve-pallet configurations is a possibility still under review. Those nations that have, in fact, committed themselves through bilateral agreements to the United States seem steadfast in this commitment. In-transit support should be available under a variety of options. Some questions do remain on operating under

wartime conditions, especially when under military air control procedures.

Again, the single, biggest drawback to maximizing the use of European aircraft for intercontinental support to NATO is low cargo assets. Although the European countries are committed to supporting a NATO reinforcement, they must do more to build cargo capabilities. If there is to be a concentration of effort in this European support system, cargo enhancement should head the list.

IV. INTRA-THEATER CIVIL AIRLIFT

After looking at intercontinental civil airlift, I believe that there is a workable system for using European aircraft during rapid reinforcement of NATO. Questions about numbers of cargo aircraft cause concern. Serious questions about aircraft types, funding of cargo enhancement capabilities and possible problems during hostilities are also real issues that the CAPC, the Senior Civil Emergency Planning Committee and the North Atlantic Council must deal with. However, nations are pursuing bilateral agreements to provide significant European civil airlift for a NATO reinforcement. The commitment by most of the European NATO members is real; the use of bilateral agreements simply makes each commitment more assured. All of this makes use of European civil aviation a good idea, especially for intercontinental lift. However, when I looked at the intra-theater civilian lift support program currently envisaged to assist the military in-theater, I came away with the idea that little significant support to the military would come under the current NATO program. What are some of the problems with the current system? What, if anything, can be done to improve it? Just taking a closer look at the civil airlift intra-theater system and its procedures and capabilities suggests some of the answers to these questions.

INTRA-THEATER AIRLIFT UP CLOSE

Who will be the primary military user of intra-theater lift in a European contingency? Again I think the United States will have the primary need for this support, since it has an interest in, and commitments to, almost every continental European country. While these are, in a way, commitments to NATO, having military personnel stationed in almost all of the European NATO nations serves US interests also. Understandably, then, the United States' contingency plans during reinforcement also call for significant deployments to those European countries. Given the multiplicity of commitment locations and, in many instances, concentrations of logistical support elements and facilities, the United States will have large lateral movements within Europe. While many of these could be accomplished by surface transportation, a significant number of high priority requirements invariably will require airlift, often over considerable distances. Commitments to northern Norway or eastern Turkey from Central Europe involve significant air miles. The impact on intra-theater airlift support could be significant when a large share of it is needed by the United States because of its multiple areas of responsibility and the distances involved.

Geography dictates the requirements of the European NATO members for intra-theater civil airlift. Central European countries are so close geographically that their airlift requirements are tactical in nature and over limited distances. While there are some inter-country commitments such as the ACE MOBILE FORCE (a highly mobile combined NATO contingency force),[17] most of the European NATO countries will

stay and fight in their homelands or nearby, eliminating the necessity for significant intra-theater airlift in Europe. The peripheral countries, Norway and Turkey, have large distances to traverse just in their own countries. Britain and Portugal, too, because of their reinforcing roles, have a greater need for intra-theater airlift than, for example, Denmark or Greece. Even with these considerations, the United States, and not the other NATO countries, will probably have the largest need for intra-theater civil airlift support.

What of this need? Is it significant? Could military airlift satisfy all of the requirements so that the United States won't need to ask for supplementary civil air support from the European NATO members for intra-theater movements? One frustration that I share with a great many who have reviewed the strategic and tactical mobility requirements for Europe centers on the lack of an adequate definition of requirements. Most conclude that there are too few planes to support all the anticipated and assumed requirements for intra-theater airlift. Part of the difficulty in defining the shortfall lies in the time periods that are established and the assumptions that are made about the advance warning of an impending conflict. Furthermore, as the United States and its NATO allies modify, restructure, and reposition forces on the European continent and pre-position supplies and equipment, the requirements shift and change.

Planning involves a look to the future, and mobility planning may involve consideration of actions or omissions that do not occur as projected. So the frustration continues. Mobility planners often question if anyone knows what the requirements really are. Planners who deal with both inter-and intra-theater

airlift share this belief. They agree that, assuming relatively short warning, not enough military airlift will be available to meet the intra-theater airlift requirements in a major European contingency. As with inter-theater airlift, General Thomas M. Ryan, Jr., former commander of the Military Airlift Command, cited the 1980 Mobility Study for Congress that recognizes the need for "substantially increased airlift capability in . . . intra-theater modes."[18] Going on the basis that insufficient military airlift, and specifically, US military airlift, will be available to support US requirements, we can only conclude that we must add more capability or depend upon other airlift sources or both.

What of military airlift support from the NATO countries? Is there any reason to expect that military aircraft from the European countries could supplement US aircraft to help meet US requirements? The answer is yes and no—but mostly no. Given financial constraints and the high cost of aircraft, the NATO countries will not procure military airlift assets beyond their own requirements. In fact, many of the European countries depend, in part, on their own civil assets to supplement military airlift requirements. In some countries, the national civil air assets are militarized or come under military control in a crisis. Few NATO members could meet any major US intra-theater airlift needs with their own military air assets. Some scenarios, however, could find European military air assets supporting US needs. During airlift coordination in the combined arena, a US requirement may be met by the airlift assets from another NATO member. Conversely, it is possible to use US military airlift to support requirements from other countries, and its planes will also be available to the combined NATO

airlift system. So while it is possible for US requirements to be met by military air assets from another country's military aircraft, we can't expect the European countries to have sufficient military airlift assets to make up any significant US shortfalls. Individual needs and the lack of funds prohibit building excess aircraft.

Unless the United States builds more planes, the only remaining potential source of airlift is the intra-theater civil air assets of the European countries. Unfortunately, the United States has no immediate plans to build additional military intra-theater capable aircraft. The C-17 program, first proposed in 1981, does have support in the Department of Defense. However, even if this program receives congressional funding, deliveries of the aircraft will not start until 1992 and will not be completed until the year 2000.[19] Additionally, the C-17 is designed to be both an intercontinental as well as an intra-theater capable airplane; therefore, its availability for intra-theater lift remains to be seen. Decisions about keeping or phasing out the intra-theater C-130 fleet will also be required. All these changes will have an impact—how much, no one knows. This, along with an unclear intra-theater airlift requirement demands we explore other intra-theater airlift options to include the use of European civil airlift assets.

EUROPEAN CIVIL AIRLIFT—THE NUMBERS

Is there a substantial quantity of European civil aircraft that could be used in an intra-theater role? Although the answer to this question is not clear, my research indicates that in addition to the scheduled civil

air carrier fleets of the Alliance members, there are a large number of small airline companies, some privately held, and others that are subsidiaries or branches of the major airlines, that have a variety of intra-theater aircraft. Most are charter companies. Aircraft and companies range from ones like Instone Airlines of Great Britain, which specializes in airlifting livestock with two Bristol MK.31 Freighters and a leased DC-8-63, to Busy Bee Airlines of Norway, a regional passenger airline with one Boeing 737-200, seven Fokker F-27 turboprops, and one Shorts Skyvan.[20] In between are a number of small and not-so-small companies with every variety of airlift equipment imaginable. Their financial and governmental ties are not clear only because of the sheer quantity and variety of arrangements under which they operate. Despite any legal or operational constraints, after reviewing the Airline Handbook,[21] I conclude that a significant number of intra-theater civil aircraft are available in the European theater.

Assuming that a large quantity of civil airlift exists for use in the theater requires caution. As with intercontinental lift, there is an obvious lack of cargo capability. While many of the European companies indicate a cargo capacity, the vast majority are passenger airlines, either in scheduled or in charter service. Only a handful of the companies are freight-oriented—Instone Airlines (the livestock carrier) being one of them. Elan International, a small cargo express/courier airline, and Heavylift Cargo, a specialized airline, both from Great Britain; German Cargo, a subsidiary of Lufthansa; UTA of France; and Cargolux of Luxembourg are devoted primarily to cargo, mainly in the intercontinental arena.[22] Otherwise, most of the

cargo capabilities are adjuncts to passenger operations. Additionally, if you remember that the larger cargo aircraft are used primarily in an intercontinental role, the remaining, smaller cargo aircraft do not present a major lift capability that could make up large US cargo shortfalls, particularly in the outsize and heavy-lift areas. Some aircraft are capable and potentially available to help meet US and NATO cargo shortfalls. But they are hidden in the hangars of the small regional airlines and charter companies and on the books of companies that specialize in leasing aircraft. The variety of aircraft, their differences in capabilities, and their ownership arrangements make this source of capability one that cannot be depended upon for major assistance. As to passenger aircraft that are potentially available in the intra-theater arena, the large number of these certainly makes their use a feasible way to offset any passenger shortfalls.

Many agree that intra-theater civil airlift for passengers could be acquired from the European civil carriers. There are aircraft potentially available and the system exists to aid in obtaining that support. Built around the crisis element, the Bureau of Coordination for Civil Aviation aids in that process. Some quantity of cargo support could be made available also, even though it would be small in numbers and only for smaller sized cargo. There are, however, additional problems that must be resolved before one country's civil aircraft flies within the theater in support of another country. What of the legal status of the airlines? What effect will this have on their ability to obtain support from the civil airlift sector? Can the BOCCA be an effective organization for orchestrating the requests?

INTRA-THEATER AIRLIFT PROBLEMS

One of the potential problems that I see in the concept of using the smaller European civil aircraft by other NATO countries is the legal status of the aircraft in the event of a contingency. Though many don't share this point of view, I believe that some problems would occur.

Because most of the airlines are national assets or because of the total defense concept of some of the nations (a concept held by some of the European nations whereby any privately held asset is to be available for military use in the event of a national wartime emergency), those civilian aircraft not previously committed by a bilateral agreement could be held for military use. Only the larger, intercontinental aircraft are now involved in bilateral agreements and only for a NATO European reinforcement.

Though the NATO countries have, in principle, committed their excess civil assets to the BOCCA, no detailed agreements now cover the use of smaller aircraft outside NATO CAPC documentation. Their use in NATO is intended to come, if at all, through the BOCCA and then on an as-needed basis. However, the BOCCA has been established to arrange for the use of excess civil aircraft. In the words "civil aircraft" lies one of the problems as I see it: if the aircraft not previously committed by bilateral agreements are held back for military purposes, will there be any significant number of "civil" assets available for the BOCCA to coordinate? Will the aircraft previously counted as civilian aircraft still be made available through the NATO civil emergency channels? It is my opinion that more aircraft than anticipated will be placed under

the control of a country's military authorities, and hence be beyond the influence of the BOCCA.

The rationale for saying that the BOCCA will have little influence is based upon two issues. First, it will be difficult for national planners and defense authorities to let an asset continue under civilian control when that asset could be committed to another country. Second, in theory, if controlled by military authorities (either because of a nation's defense concept or because the assets are militarized), the civil aircraft could be made available to major NATO commanders through the military airlift cells in the applicable regional headquarters. For example, I understand that the civil air carriers of Italy, which are national assets, would be placed at the disposal of the military in that country. Consequently, the aircraft could well be used to support not only Italian unilateral military operations but also combined operations that are planned and controlled by Headquarters, Allied Forces, South (AFSOUTH). AFSOUTH, as NATO's Southern Region Headquarters, has its own airlift cell to coordinate combined airlift requirements in its region. Under this approach, the Italian civil aircraft would not be made available to the BOCCA for coordination. As explained earlier, the BOCCA military requirements will come from the military side through the airlift cell at SHAPE Headquarters; however, the assets that are to be coordinated by the BOCCA will be made available through the national civil air control centers of the various nations. The Italian aircraft cited in the example will not leave military channels under the system described unless released back to civilian control by the Italian defense and military authorities.

Some may argue that I have overstated the nationalization/militarization issue as a potential problem. These counter-arguments certainly contain some legitimacy. The NATO countries have, in principle, committed themselves to making excess civil aircraft available to the BOCCA. We cannot assume that those commitments were made lightly. The difficulty is that it is almost impossible for military planners to view the BOCCA as a source of airlift that can be incorporated into specific movement plans. Additionally, despite the good intentions of the NATO countries, it will be difficult for many national defense planners to release assets at the onset of a major crisis when no specific, detailed agreement calls for them to do so, such as the bilateral agreements covering intercontinental aircraft. As a result, one of the reasons why I do not believe that the BOCCA will be particularly effective, especially for military purposes, is because it may not have many aircraft to coordinate.

Two other problems facing any planned dependence upon European civil aircraft for intra-theater lift are the ability to communicate securely and the ability to transfer requirements and information in a timely manner. To begin with, the BOCCA, as well as other wartime NATO agencies, cannot guarantee satisfactory and secure communications. Plans call for secure telephone capabilities between the BOCCA and the various national civil airlift control centers. However, even if this goal is met, timely transfer of information, and commitment data, will still be a problem. The manipulations that must occur to get an aircraft from one country to another, on an on-call basis, in order to support the requirements of the other country, quickly discourage any dependence upon the current

concept to use European civil aircraft in an intra-theater role.

In review, a request for military airlift is normally processed through NATO military airlift cells. Thus, if a NATO regional headquarters—AFNORTH, AFSOUTH, or AFCENT (Allied Forces, Central Europe)—cannot meet the airlift request from a subordinate command, the request is transferred to the airlift cell at SHAPE. Interregional military airlift movements also are coordinated with the ACE airlift cell. If the requirement cannot be met with the military assets known to SHAPE or if there is some reason for holding military assets in reserve, then the request passes to the BOCCA. (Also, a country can and would normally go directly to the BOCCA for civil airlift support when the lift is needed for civil emergency purposes.)

To manage the airlift requests that it receives, the BOCCA first reviews the daily civil airlift status reports to identify the countries with the best potential for meeting the civil airlift request. The BOCCA then coordinates with the national civil airlift information center of the potential supporting country to determine if the country can meet the request. The national center, in turn, contacts one of the country's airlines to determine if the airline can meet the requirement. Assuming that the response is positive, final arrangements are made between the supporting and the supported countries, and more specifically, between the requesting agency and the airline providing the support. If the request comes through military channels, probably a military element generated it. Therefore, the supporting country will ultimately

work directly with the military element of the supported country—something that does not normally occur in peacetime.

Minimally, for military requests, the process involves a variety of communications between unlike elements which can slow down the process and provide the opportunity for misunderstandings and miscommunication. As a result, this somewhat cumbersome process reduces the likelihood that the BOCCA can be a significantly effective and timely source for obtaining civil airlift support for intra-theater airlift requirements. Simplification of this process is one of CAPC's planning objectives. In actual practice, saturated communication nets would most likely force some streamlining in the system, once in use.

In reviewing the issues surrounding the BOCCA and its role in coordinating the use of civilian aircraft for intra-theater support, I conclude that the United States has the greatest need to look to European civil aircraft as a possible source of airlift. The United States has commitments in almost all of the NATO countries, and it has logistical elements throughout the European continent. It also has a shortage of US military aircraft to support its intra-theater contingency requirements, even though the definition of these requirements is somewhat obscure. Yet, looking to European carriers for the needed support brings its own set of problems. The number of cargo-carrying small aircraft and heavy-lift short-range airplanes is limited. Many of these aircraft may be controlled by the national defense element, or may never be available to the BOCCA for coordination and use by another NATO country. If the airplanes are available, the communications limitations and the layered channels of

coordination also restrain significant dependence on these assets for military use. Despite these difficulties, I do think there are ways in which the European civil aircraft can support some of the intra-theater requirements. Their use requires a significant amount of planning and coordination and will be discussed later.

V. COMMON CONCERNS

Although I have been optimistic about the intercontinental civil airlift support area and pessimistic about the intra-theater role, some difficulties are common to both. Airlift planners must deal with both areas, and often their concerns do not distinguish between them. Some of the common problem areas are airport reception and handling capabilities, air traffic control, rapid airfield facilities and runway repair, and the handling of hazardous materials. Willingness of the NATO countries, in a general way, to support fully the CAPC in all its efforts has also been a concern expressed by some of the CAPC participants.

AIRPORT RECEPTION AND HANDLING CAPABILITIES

Can the European airports handle the rapid influx of military and civilian airplanes, and will they be able to handle personnel and cargo without major difficulties? Since this question relates to the problem of requirements, the answer is, at best, vague. Gross estimates of inbound cargo and personnel matched against all of the European military and civilian airfields do produce an affirmative answer to the question. However, the answer is less certain once specific consideration focuses on concentrations of inbound and outbound cargo and people and the need to have them at specific locations. Therefore, one of the biggest

drawbacks to determining if airfield reception capabilities are sufficient is poor definition of airlift requirements, particularly those for intra-theater lift. While overcoming these difficulties may seem to be impossible, some actions underway right now may help.

In discussing this problem with both NATO and US officials, I found a great deal of concern over the possible clogging of airfields. Lack of aircraft ramp space emerged as a major problem. Concern also exists over the availability of handling equipment, airfield clearance capabilities, onward movement, and the general availability of facilities. Efforts are underway to define and evaluate the capabilities and to present possible solutions. The CAPC is involved in looking at these problems and at the whole spectrum of civilian airfield reception and onward movement potential. Current efforts involve surveying various civilian airfields through the nations' representatives to the CAPC. Part of their problem in evaluating civilian airfields is that the reinforcement lift data has, until the recent past, been closely held information. This is changing. For example, US movement data is now being made more available. Also, efforts now include evaluations based upon worst-case scenarios. Here again, the requirements change as do the assumptions upon which they are based. Many times, too, the requirements are a product of futuristic ideas about how units should be deployed or about where supplies and equipment should be positioned at some far-off date—not how they are or how they will be once realistic budgetary and political constraints are considered.

AIR TRAFFIC CONTROL

As we've seen, control of airspace in a "hot" theater could present difficulties to European civil aircraft.

The problem is simple to define, the solution more complex. The basic problem is that within a war zone, peacetime air traffic control procedures may be preempted by military procedures. Outside the war zone, during the transatlantic portion of a flight, civilian control procedures will be used. However, upon entering a combat zone, aircraft must have, and use, communications authenticating tables to identify themselves to friendly forces. This procedure requires not only access to the tables but also some training in their use since secrecy is essential to preventing unfriendly incursions into Allied controlled areas. Peacetime training and distribution of the tables to civil carriers and their pilots increases the likelihood of compromising extremely essential information. Distribution in the event of a crisis or war still makes compromise possible and will require some training time at a point when no time can be spared.

What are some possible solutions? One approach would be to train pilots now with facsimile tables. Also, clearances could be obtained for as many of the civilian pilots as possible. At the outbreak of a conflict, the tables could be distributed to the pilots just before a departure from the United States or, in the event of an intra-theater requirement, before a departure from the appropriate European airfield. Another approach would be to provide military personnel trained in the use of the tables, as an extra crew member, for a NATO support-mission. Their primary responsibility would be to authenticate the transiting civil aircraft to both civil and military airspace controllers. Both solutions carry with them the costs of implementation and of continuous updating. However, they would provide the

civil air carriers with a way of authenticating their legitimate presence in a war zone. Otherwise, these carriers may be unable to fulfill their NATO mission.

RAPID RUNWAY AND AIRFIELD FACILITIES REPAIR

The question associated with rapid runway and airport facilities repair is whether their restoration is possible under wartime conditions. Most military airfields have established a repair capability either through host-nation support or through use of military personnel. No such clearly defined capability exists for civilian airfields damaged in the course of war. Progress is proceeding on this CAPC initiative but, as with many complicated NATO goals, the solution will take a large amount of coordination and effort. It is a problem that, when resolved, will provide procedures for quick progress to repair airfield damage.

AIRLIFT OF HAZARDOUS MATERIAL

Airlift of hazardous material on US military aircraft is a frequent event. Aircraft loading and compatibility procedures are well established. Most military airfields also have well-established handling procedures and have designated hazardous material holding areas to accommodate the movement of dangerous materials. Problems for US and European civil air carriers that will support NATO include the lack of agreed upon compatibility, data transmission, and civil airport reception procedures. Civil air carriers very likely will be asked to transport hazardous materials—in particular, ammunition—if a European war becomes a reality. This need could occur between continents and within Europe. The difficulty, until recently, was the absence of coordinated procedures for

the safe transport and handling of these materials while in the civil system.

The CAPC is successfully resolving many problems in this area. Lack of standard compatibility procedures for loading of civilian aircraft with hazardous materials is being solved by adopting already approved standard NATO procedures for military aircraft. Hazardous materials can now be airlifted under these procedures. While this would probably happen on civilian aircraft in a crisis, with or without an agreement, formalizing the procedures eliminates potential hesitancies.

Another concern on the part of a minority of the nations was that of information flow. These nations wanted to know exactly when and where an aircraft would be transporting hazardous materials. They were concerned about having aircraft fly over their countries without knowing the cargo or airport destination. They also feared that an aircraft with high explosives or some other dangerous commodity might have to make an emergency landing at an airfield unprepared to handle hazardous materials and that air controllers could not handle such a situation properly if they were unaware of the nature of the cargo on the airplane. These countries were asking for advance identification, through normal routing and flight plan procedures, of dangerous cargo passing through their airspace. They also requested advance warning to the actual destination airfield. Without advanced notice that an aircraft has hazardous material, the airfield presumably could not properly prepare to receive the cargo. CAPC has also undertaken to resolve this issue by modifying some data fields used for standard routing information and altering systems to receive all the

data. The basic capability is already there. It is a matter of expanding upon it or, in the case of some countries, tapping into it.

Overall, the CAPC has done a good job of addressing the basic difficulties associated with moving hazardous materials in the NATO civil airlift support system. Use of standardized NATO procedures for airlifting hazardous cargo on military aircraft and tapping existing data transmission sources should resolve nagging issues.

WILLINGNESS TO SUPPORT

The CAPC, by any measure, has been quite successful since its "awakening," despite so-so support from some countries. Many countries have not sent their aviation experts to the committee and working group meetings. Involvement by qualified experts from the aviation companies in each of the countries and less reliance on administrative personnel from transport ministries will help the CAPC the most. But nonsupport continues to be blamed on travel and billeting costs along with the difficulty of releasing key people to attend. Such foot dragging slows progress and diminishes attention on this very important area. This in no way implies failure on the part of the CAPC. Rather, it suggests how the CAPC could be even more successful if more qualified representatives were always available. Their resolution may be slow, but success in any one of these areas or in all of them will serve to fortify the overall commitment and viability of using European civil aviation to help in the defense of Western Europe.

KEY CIVIL AIRLIFT ISSUES

Two crucial questions emerge: which issues present the greatest challenges and where do the opportunities lie? Answers to them will go a long way toward resolving many of the concerns expressed by the Alitalia pilot at the beginning of this book when he wondered about the use of civil air and the system for doing so. I believe that the planning for emergency use of intercontinental civil airlift is proceeding well, yet, I also see areas where improvements can be made.

VI. IMPROVEMENTS IN INTERCONTINENTAL AIRLIFT

The progress in planning for the use of Europe's civil air assets to supplement US military and Civil Reserve Air Fleets in their reinforcement role is exceptional. This comes primarily from the dedicated actions by members of NATO's Civil Aviation Planning Committee. Serious efforts began in the late 1970s and continue today, and the result is that a significant number of European NATO countries now have bilateral agreements with the United States. These agreements detail the use of a prescribed number of European civil airplanes to assist in airlifting US troops and equipment to Europe in the event of a European war. The airlift will only occur if the North Atlantic Council has called for the reinforcement of Europe. Bilateral agreements are extremely positive developments that add binding to the international support relationships and commitments of the NATO countries. While I will address a number of issues that still require resolution or could, in my opinion, be improved, the basic fact that these bilateral arrangements have been established and agreed to is, in itself, an outstanding accomplishment undiminished by my comments or suggestions.

INCREASED SUPPORT LEVELS

Few would dispute that it would be beneficial for the United States to obtain more cargo airlift support from Europe. From my interviews, I conclude that there are more aircraft available than have been provided so far. As I previously mentioned, there is a natural reluctance by the European countries to commit all of their intercontinental capable aircraft, at least initially, to a European reinforcement. There is no quick solution to overcoming this reluctance. Continued steady diplomacy at both the working (CAPC) level as well as quiet persuasion by NATO's secretary general may be the most successful approach to this problem. Each European aircraft committed to the reinforcement role reduces US expenditures. Therefore, it benefits the United States to continue to press CAPC to emphasize the need for more support.

In addition to persuading countries to add to their support levels, there is one additional area that would offer some relief. Spain has, to date, not been active in the CAPC. While direct pressure is inappropriate when Spain's internal political situation is so delicate, future support from this source would be most helpful (as would the commitment, also, of French aircraft). Spain has a total of fifteen wide-bodied and nine narrow-bodied aircraft available and France has forty-one wide-bodied and seventeen narrow intercontinental aircraft.

ENHANCEMENT OF PASSENGER AIRCRAFT

The most serious problem, both for the CAPC and for the United States, is the lack of adequate cargo lift. Enhancement of European civil passenger aircraft is,

at best, a remote possibility. The only dim hope is that the European countries would take the lead from the United States, which has finally achieved some success in this area. Now, congressional funding to support enhancing the Pan Am 747s takes away what some officials say was an excuse for the Europeans not to support enhancement of their own airplanes. If we want the Europeans to add to their cargo carrying capabilities, now is the time to do it. The United States has finally taken this step with some of its own civil aircraft. Though this action could serve as an example to the Europeans, realistically there is little basis for optimism. Given the costs involved, it is unlikely that there will be any changes unless and until the international cargo market creates a need for such airlift capacity.

The capability to improve the cargo capacities of the 747 combination aircraft does offer some real possibilities. The costs to increase these capacities simply by stockpiling hardware for this purpose are, by comparison to other cargo enhancement programs, an inexpensive proposition. CAPC's current proposal to use NATO infrastructure funds for this purpose is a good one. Because the distribution of combination aircraft varies widely between countries, the hardware must be stockpiled in such a way as to avoid one country gaining a competitive edge over another if common NATO funds are used. Support for this idea offers the best solution, since the countries hesitate to provide the funds for the conversion of their own airplanes when the marketplace does not require additional airlift capacity.

IN-TRANSIT SUPPORT

The provision of in-transit maintenance and refueling support is not considered a major problem so

long as there is not a major international confrontation. That is, if the support is being provided before war erupts, support for European civil aircraft should be readily available through the airlines' normal civil sources. If the theater is active and the civil system is in a state of disarray then support may be difficult to acquire. Three potential US-related sources have already been described: the CRAF Senior Lodger System, US Military Airlift Command military sources, and host-nation support now assisting US Forces. Any one of these sources or a combination of all of them has the potential to provide adequately normal in-transit support at designated locations. The next step, I believe, is to develop these options to the point where they are fully identified to each of the potential airfields that might be used in the event of a crisis. This is no small task, but it will reassure the European airlines to know that a particular method of support is prescribed for them at a given location. It also seems to be a good idea to ensure that the support element, whether a US military source, a CRAF lodger airline, or a host nation, knows it may be required to support civil aircraft from any one or all of the European NATO countries.

TESTING THE AIRLIFT SYSTEM

Unfortunately, no specific plans are underway to have an exercise of the NATO procedures involving use of Europe's civil air assets. Such an exercise is necessary, since, as with any contingency operation, practice can only improve performance for the real thing. It would provide planners and operators (to include the European civil airlines) an opportunity to test the agreements under which they would operate during

reinforcement. Modifications, if required, could be made.

What would it take to do this? One approach would be to ask each committed country to participate, for example, during a WINTEX exercise. Communication procedures could be checked. Origin, routing, and destination instructions could be evaluated. Some type of extraordinary in-transit support could be incorporated. Any unusual or suspicious areas might be evaluated for possible changes.

Two difficulties with exercising the European support planned for reinforcement are the possible political ramifications and the cost of flying airplanes on hypothetical missions. Politically, not all of the European countries advertise the fact that some of their civilian aircraft are committed to the reinforcement of Europe. While the arrangements have not been hidden from the public, some of the countries are, because of internal political concerns, unwilling to detail these. Actually, including the aircraft during an exercise would only highlight the commitments. The second, and probably more practical, reason for resisting the use of aircraft during an exercise is the cost of doing so. Who will pay for it? No one can say. Some possibilities include using NATO funds, obtaining unilateral support from the United States, or pressuring European NATO allies to support such an effort. From a US perspective, NATO funding or participatory funding by each committed nation would be ideal. However, since the aircraft are augmenting NATO airlift needs by filling US shortfalls, US investment in exercise funds would be money well spent. The basic point, however, is that exercising the system would improve its chances for success when needed.

VII. NECESSARY MEASURES

Bilateral agreements to use Europe's intercontinental civil aviation assets to support a NATO rapid reinforcement should be developed and supported. Efforts should continue to increase support levels, build in cargo enhancement features in some of the wide-bodied passenger aircraft, and pursue purchase of the pallet hardware to increase cargo lift capability of the currently available B-747 combination airplanes. In-transit support priorities should be established, and both those giving support and those being supported should be familiar with these options. If at all possible, NATO should plan exercises for the system.

I have serious reservations that there will be any real support to the military through the BOCCA, the wartime crisis element associated with the CAPC. These reservations pertain to the system and the assumptions under which it is to operate. Despite these reservations, I do not believe the BOCCA should be abolished or significantly changed internally. I do believe that the issues associated with the BOCCA, some of them hidden, must be resolved. I also believe that some actions can improve the certainty of obtaining more definitive military support in the intra-theater environment. I will detail those suggestions after discussing my reservations about the current methods for

obtaining intra-theater civil airlift support in the NATO environment.

ISSUES ASSOCIATED WITH THE BOCCA

The Board of Coordination for Civil Aviation, or the BOCCA as it is most often referred to, is first a coordinating body and second an information center. In its coordinating role, it will act as a broker looking for airplanes for those NATO countries and SHAPE military authorities that need airlift. In this capacity, the BOCCA has no authority to direct. Its authority stems from the national commitments to NATO. In no way is it like the authority that the combined NATO commands have over soldiers on the battlefield. Military forces are pre-planned and generally given specific areas of responsibility. The aircraft that the BOCCA would arrange can be obtained only if a nation chooses to honor a support request. The nation approached has only to say that they do not want to provide the requested support and to leave the requesting BOCCA official with no leverage to pursue the request except through his personal qualities of salesmanship and persuasion. A pre-commitment of forces, on the other hand, gives the requester and the BOCCA "broker" a basis upon which to argue for the assistance. A possible solution to this problem will be offered when I discuss potential improvements to the intra-theater civil airlift support system.

The second, and perhaps more critical, issue in this area is whether the various countries will really make their civilian airlines' aircraft available. Countries will be reluctant to offer their aircraft to the BOCCA ahead of perceived national priorities, especially those not committed by bilateral agreements.

Some military and civilian government officials believe that support would be given. Others express doubt. Some of the recent NATO exercises indicated that the BOCCA would, in fact, be given an opportunity to arrange for the use of civil aviation assets. I am an advocate of exercises, but I look at their results with some suspicion. Perhaps the drive to have successful exercises has as much to do with the use of civil air assets as any individual national commitment. As to the options offered by various officials, none could cite any study that detailed the arrangements under which each country's civil aviation would operate if there were a European war. This is not to say that such a study has not been completed, but I found no indication that it had. True, the participating countries have offered their support, though not in specific terms, so a case can be made that what I identify as a problem may not be one. My basic point is that for a military planner, it would be extremely difficult to depend, in advance, upon European civil aviation assets for any definitive intra-theater support given the various possible constraints that could be applied in any one country.

Aside from the issue of military versus civilian control, other problems that need solutions include the time it takes for requests to reach the BOCCA and the ability to provide a timely and usable response. The current system is cumbersome. A request for military airlift support originates in the military airlift element of a particular country or regional headquarters. It is then processed through military channels until, at the ACE Airlift Cell, someone decides to offer the request to the BOCCA. At that point the request goes into civil channels. The BOCCA must then search out a country which, in turn, must find a civil carrier that

can accomplish the mission. Once the mission request is agreed to, the decision must be communicated from the supporting country—more accurately, from the designated supporting airline—to the requesting military organization in another country. There are many layers through which the request must travel including the BOCCA's coordination with a country that has the capability and the willingness to support the request. Still further coordination must then be made between the designated supporting airline and the requesting military element in the originating country. Given these various levels and possible pitfalls, I cannot recommend this system for obtaining critical intra-theater military airlift support.

Any success in reducing the time consumed by this process must come from continued exercising of the system. (I say this despite my reservations about reading too much into the results of exercises.) Exercises now occur only to a limited degree and on a relatively infrequent basis. These should include communications between the designated supporting airlines and the requesting military organizations. Coordination and communication, which everyone must perform well, need the practice only an exercise can provide.

ISSUES WITHIN THE BOCCA

Issues internal to BOCCA are troublesome only insofar as they create doubt as to whether it can operate efficiently. Secure communications with the national civil aviation centers of the participating countries is a major problem for the BOCCA to overcome. It and the other civil-wartime NATO crisis elements are all ultimately due for additional secure

communications. The only recommendation to offer in this area is to continue to press forward.

A second problem is staffing the BOCCA with airline industry experts from the various countries. Not all of the staff positions have been filled. To operate, the BOCCA has to know who its personnel are and train them through exercises. This is being done to some degree, but added effort and support is needed.

WILL THE BOCCA WORK?

Yet I continue to have reservations about obtaining any significant intra-theater civil airlift support for the NATO military forces through the BOCCA. I see it as a cumbersome system built around voluntary on-call airlift. Limited communications exist for the Board to use in a crisis. More importantly, for a military force to use the assets, it must communicate between unlike elements. I continue to have doubts about the availability status of the civil airplanes from the different countries. Will they be counted as military assets or held for military purposes or will the civilian operators have the authority to offer them to the BOCCA for use? These concerns all cast a shadow on the effectiveness of the civil airlift capabilities to support NATO military needs in an intra-theater role.

My prescription for resolving many of these difficulties includes many steps. I would survey the intra-theater civil airlift assets potentially available in each of the participating countries to determine their availability, but with emphasis on the potential uses the countries might make of the assets before being released to the BOCCA, and I would attempt to arrange for as many pre-committed civil aircraft as reasonably possible. This could be accomplished even if only 15 or

20 percent of the total intra-theater airlift requirement could actually be identified. This approach would put civil airlift where it is needed in a far more timely manner than the current request or arrangement situation. It would also free military airlift for more dangerous and close airlift support missions. I would continue to support the CAPC actions already underway to strengthen the communications and staffing capabilities of the BOCCA. Despite its current shortcomings, I would not abolish the BOCCA. Its purpose is far too worthwhile. As both a coordinating element and as an information center, it has a full and essential mission.

VIII. IMPROVING INTRA-THEATER SUPPORT

I have presented my doubts about the country-by-country availability status of civil aircraft, the capability to communicate securely, and the potentially cumbersome and time-consuming methods for obtaining intra-theater civil aircraft as the primary reasons why I have serious reservations about obtaining airlift support through the BOCCA. What can be done to improve the ability to obtain airlift support from this possible source?

My prescription for improving the intra-theater support from European civil air assets is threefold: determine the status of the uncommitted European civil aircraft, arrange for the pre-commitment of a previously arranged level of these assets, and strengthen the BOCCA.

DETERMINE THE STATUS

We have to know which country is willing to commit what airplanes. If we do not, the haunting question of status will continue. I think that the CAPC should survey each country on the status of its aircraft in the event of a war. Typical questions that should be asked include if there are plans to hold back civil aircraft for unilateral military purposes, or if only a certain percentage of them will be reserved. Those countries where military control is a distinct possibility should

be asked if they can commit some percentage of their assets to the BOCCA for possible NATO use. Some countries will resist describing their intra-theater civil airlift status, believing that doing so may lead to pooling of civil air assets. This idea has received consistent resistance. However, under present conditions NATO requests the CAPC and the BOCCA to coordinate airlift when no one is certain whether aircraft will be available for this purpose. A survey should help answer those questions, perhaps even show that there is no problem, and that a significant number of civil airlift assets will be made available, especially for intra-theater requirements.

PRE-COMMIT EUROPEAN INTRA-THEATER CIVIL AIRLIFT

The CAPC has already arranged successfully for the pre-commitment of European civil airlift assets in the reinforcement role. My suggestion is that this approach also be applied, to the highest degree possible, in the intra-theater environment. My belief is that the United States will have the vast majority of the intra-theater airlift requirements—particularly those that involve any significant distances. US commitments span the entire European continent and reach into Eurasia, and significant distances are involved in some of these lifts. Any variety of equipment or cargo, as well as personnel, may require airlift. I think that preplanning for some of these requirements and pre-committing European civil airlift to them makes good sense. The single biggest advantage in doing so is that it takes the uncertainty out of this system.

My proposal involves dealing with intra-theater requirements. However, I do not suggest that one

should wait until all the intra-theater requirements are defined before applying European civil air assets against those requirements. That may never happen. Rather, I suggest that while there is significant uncertainty in the intra-theater requirements for airlift, there is enough certainty to allow some pre-commitment to proceed. At least 10 to 20 percent of the intra-theater airlift requirements should be known, even if they change periodically. Some of these requirements could be reserved now for civilian aircraft. This does not mean that specific European civil aircraft need be slotted against a specific requirement; rather, it means that pre-commitment of a certain number of intra-theater capable aircraft, as with those committed to reinforcement, would allow military planners to identify cargo and personnel in advance for the civil aircraft.

I further suggest that we develop loads for the longer distances or for specific sortie requirements that could be met by repetitive lifts from the same airplanes. Under the current system, I foresee that civilian aircraft, even of the smaller, intra-theater variety, will be sought for tactical lift forward into the combat zone since under the current BOCCA system civilian aircraft will not be requested until most military assets are committed. At the point where military air assets are exhausted, the requirements may well be to fly forward into the combat zone. By pre-planning the civilian lift of a certain percentage of the intra-theater requirements in advance, some added amount of military aircraft could be held back for the more dangerous missions. The civilian aircraft could be used in the less dangerous lifts, by choice, since no one advocates civil-

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ian crews flying civilian aircraft into the combat zone unless absolutely necessary. Planning civil lift for some of the early, longer distance requirements, and saving the dangerous missions for the military, would be possible only if the lifts were pre-planned.

While pre-planning for the use of a percentage of the intra-theater airlift is desirable, only a percentage of the requirements need be identified. Knowledge of the complete intra-theater airlift requirement would not be necessary to allow civilian carriers to proceed, since only a part of those airlift requirements would ever be met by civilian aircraft anyway. The majority may continue to require military air. One additional advantage of this approach would be that if aircraft were pre-committed, as they now are for the inter-theater rapid reinforcement role, then the problem of asking the potentially cumbersome BOCCA system to obtain timely lift could be reduced.

Overall, NATO can pre-commit capable civil aircraft for intra-theater use only if the users and the mobility planners identify at least a percentage of their lift requirements, and if this convinces the European NATO nations of the merit of this idea. An annual review or some other satisfactory system for updating the requirements would ensure good requirements data. With a specific level of civil lift planned for and ultimately applied against those requirements, military airlift could be held back for the unforeseen and dangerous missions that will assuredly develop.

STRENGTHEN THE BOCCA

The actions that I would contemplate to make the BOCCA itself more capable in the event of a war are already underway. NATO has begun significant efforts to

obtain secure communications between the BOCCA and the national civil aviation centers. The CAPC continues to stress the need for the individual countries to provide the appropriate personnel to the BOCCA. Accomplishing these two goals will be of tremendous internal assistance to the BOCCA. Additionally, NATO already uses the BOCCA in major exercises. The more realistic the exercises, the better the preparation for the real thing. Only practice will reduce processing and commitment support times. Moreover, the CAPC must move member countries to help the BOCCA by ensuring that each develops secure communications so that civil lift can be coordinated and provided without compromise.

Adjustments that would help the BOCCA internally have begun, and, when accomplished, will improve the ability of the BOCCA to process better information and to arrange civil airlift when military aircraft are overcommitted.

There may seem to be a contradiction in my suggestions insofar as I have recommended that a percentage of intra-theater civil lift be precommitted outside BOCCA influence while I have also suggested improvements in the BOCCA. My recommendation that some intra-theater civil airlift be pre-committed could be interpreted as a recommendation to disband the BOCCA. It is not. I do think that it will continue to play an extremely useful role in NATO civil airlift, especially in support of civil movements. However, I am also convinced that some of the civil lift can be more efficiently used and contribute more to the war effort if its use for military purposes can be more specifically planned.

The purpose of the BOCCA remains supportable. Ideally, it should have the authority to task, but given the make-up of NATO and the requirement for consensus on most decisions, it is *totally unrealistic* to pursue the idea that the BOCCA should have that authority for each nation's aviation assets. In NATO, logistics is a national responsibility. Airlift is definitely considered to be a logistical function. There are successful breaches to the logistical responsibility idea, but few. Most have been accomplished on a bilateral basis, such as some of the host nation support arrangements or the agreements that I described earlier for pre-arranged inter-theater airlift. Other than this type of arrangement, logistics continues to be primarily a national responsibility. Therefore, the idea that a NATO element would have full tasking authority over all of a country's civil aviation assets will always meet opposition. The result is that the BOCCA will be forced, if it is to continue to arrange, but not to task, civil airlift. The question is, can it serve a useful function? The answer is that it certainly can and will. Even now, exercising the BOCCA brings together airline operators from the different countries and leads to the exchange of operational information and the commonality of a bond that can only be built from a common purpose. It provides a structure by which civil airlift can be arranged during wartime despite criticisms of slowness. It is also a repository of civil air data in a crisis. Overall, BOCCA's purpose to coordinate civil airlift and to be an information center is necessary regardless of any prearranged commitments and of theater area.

IX. MORE COMMON CONCERNS

There are areas of concern common to both the inter- and the intra-theater civil airlift environments. These include airport reception and onward movement capabilities and limitations, air traffic control procedures during wartime, rapid runway and airfield facilities repair capabilities, and the handling of hazardous cargo aboard civil airplanes during a crisis. While none of these is sufficient in itself to stop civil aircraft from being used to support NATO during a crisis, resolution of any or all would enhance the capabilities and reduce the frustration associated with using the civil air assets. There are steps that can be, and in some instances are being, taken to resolve some of these issues. In other cases, a realistic appraisal may demonstrate that the concern is slight.

AIRFIELD HANDLING AND RECEPTION CAPABILITIES

I agree with the steps currently being taken by the CAPC to survey and to catalogue the capabilities of the various civilian airports that might be used by NATO aircraft. If there is any criticism of this effort it focuses on the countries that are not giving this project sufficient emphasis. In this regard, continued emphasis and support is required of each participating country.

AIR TRAFFIC CONTROL

The military communications procedures that the civilian aircraft will be required to follow during wartime may present serious difficulties. During periods of international tension and crisis including war, there are set authentication procedures. These procedures are designed to ensure that only friendly aircraft can penetrate Allied airspace without facing antiaircraft fire. It requires the pilots to have and to be able to use the appropriate authentication tables. Pilots must have the proper clearances in order to have access, or there must be someone on board the aircraft that can fulfill that requirement. I have already mentioned two possible solutions. One would be to obtain clearances for as many of the civilian pilots as possible and then train them on the use of the authentication tables. A second approach would be to have trained military specialists available at the origin airfields to accompany an aircraft that must fly under the air traffic control procedures requiring such authentication. The best approach would be to combine these two. That is, clear and train as many pilots as possible but be prepared to send trained military specialists with the aircraft going into an area operating under the wartime military air traffic control procedures.

RAPID AIRFIELD FACILITIES AND RUNWAY REPAIR

There are two immediate problems associated with this area. One is the need for civilian airfield operators to have a standard by which their ability to rapidly repair airfield facilities to include runways can be measured. The second is the need to identify capabilities for effecting the necessary repairs if an airfield

is damaged by enemy action. Military airfield operators can include overnight repairs in their definition of rapid runway repair. Yet, this approach has not yet been universally accepted by the civilian authorities. The civilian operators generally have a longer-term approach to airfield repairs. Operators must identify the types of repairs needed before they can evaluate their capacity to make those repairs. This is an issue being pursued by the CAPC.

AIRLIFT OF HAZARDOUS MATERIAL

The CAPC has resolved the major difficulties. The airlift of hazardous material is occurring now. There are standard US and NATO procedures for airlifting hazardous material on military airplanes. As a result of the efforts of CAPC members, these standards will be applied to the shipment of hazardous military cargo aboard civil aircraft in a crisis environment.

CAPC has considered the issues of airfield reception and onward movement, air traffic control, rapid runway repair, and the handling of hazardous material. All are worthwhile and important undertakings. The most critical issue of these four is the need to determine and initiate procedures for civil aircraft to enter military controlled airspace. If this problem is not resolved, the critical support that is assumed from the civil airlines may not be delivered. Regarding the other three issues, progress may be slow but their potential impact is not as great.

SUMMARY

The progress that the Civil Aviation Planning Committee has made in using European civil aviation to support the reinforcement of Europe is most commendable. The CAPC's progress, to date, in the other

areas—all related to maximizing the ability to use civil aircraft in-theater—should also be praised. The ability to use these assets, to whatever degree, reduces dependency on military assets and decreases the associated cost. Although examination of these systems may have, at times, seemed overly critical, I am convinced that Europe's civil aviation can play a vital role in its defense. The following summary (table 9:1) reviews my conclusions and related recommendations about the use of Europe's civil aviation assets.

The amazing progress I've found has been the result of the dedicated efforts of both the NATO Headquarters staff and the country representatives to NATO's Civil Aviation Planning Committee. This progress has all come about since the late 1970s. It is substantial and pertinent. Given all of these efforts, it is no wonder that we can imagine the loadmaster at Pope Air Force Base watching a Sabena B-747 lumber off into the night and marveling at this "unexpected effort of free world cooperation." This progress is a magnificent accomplishment—one in which the many dedicated NATO planners and country representatives can take justifiable pride.

Table 9:1.
Summary of Conclusions and Recommendations

Conclusion	*Recommendation*
Use of European civil air in reinforcement is an excellent idea.	Continue to support this effort in all applicable forums.
European countries could provide more reinforcing aircraft.	Continue to request support via CAPC and the Atlantic Council.
Need exists to increase cargo capabilities of European civil aircraft.	Continue to emphasize need to European countries. Support NATO funding of combination pallet hardware acquisition.
In-transit support in peacetime is not a problem. Serious questions of wartime capabilities.	Assign priorities to, and disseminate, wartime in-transit support plans.
BOCCA effectiveness to arrange intra-theater lift for military purposes is limited.	Pre-commit intra-theater civil lift. Exercise existing system more and stress need for better communications and staffing.
Status of availability of European civil aircraft during war is not clearly known.	Survey European nations to determine exact wartime status.
Civilian or cleared pilots are not prepared to use military air traffic control and authentication procedures.	Pre-clear and train as many pilots as possible. Be prepared to place military communications specialists on civilian aircraft.
Procedures for and capabilities to rapidly repair civilian airfields are not clearly defined.	Continue to support CAPC effort to include standardizing repair procedures and then to identify capabilities.

ENDNOTES

1. *The North Atlantic Treaty Organization: Facts and Figures*, NATO Information Service, Brussels, 1981, p. 157.

2. Extracted from comments of a NATO staff member during personal interview.

3. Anthony J. Burshnick, Colonel, USAF, and Markwell A. Fletcher, Lieutenant Colonel, USAF, *History of Strategic Airlift: A Research Report*, Air War College, Air University, Maxwell Air Force Base, Alabama, April 1976, p. 31.

4. Ibid., p. 26.

5. Ibid., p. 35.

6. Ibid., p. 36.

7. Extracted from point papers obtained from Headquarters, Military Airlift Command, during personal interviews.

8. Burshnick and Fletcher, p. 37.

9. Extracted from point papers obtained from Headquarters, Military Airlift Command, during personal interviews.

10. Michael B. Perini, Major, USAF, "Airlift for Near and Far," *Air Force Magazine*, October 1984, Air Force Association, pp. 45-49.

11. *North Atlantic Treaty Organization: Facts and Figures*, p. 38.

12. Ibid., p. 39.

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14. "NATO Airlift Deficiencies Seen in Zaire Evacuation," *Aviation Week and Space Technology*, 29 May 1978, p. 22.

15. Cost estimate is based upon 1984 data as provided in a May 1984 letter from the Boeing Company.

16. CRAF Senior Lodger System was initiated as a means for US CRAF civil aircraft to receive support at airports where their company does not have servicing capabilities. It would be effected only during emergencies when CRAF airplanes are activated.

17. Alan Curry, Group Captain, Royal Air Force, "Moving a Mobile Force," *NATO's Fifteen Nations*, Aug-Sep 1982.

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19. Extracted from data provided in personal interview with personnel from Headquarters, Military Airlift Command.

20. Extracted from *1983/1984 Airline Handbook*.

21. Ibid.

22. Ibid.

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Can NATO Count On It?

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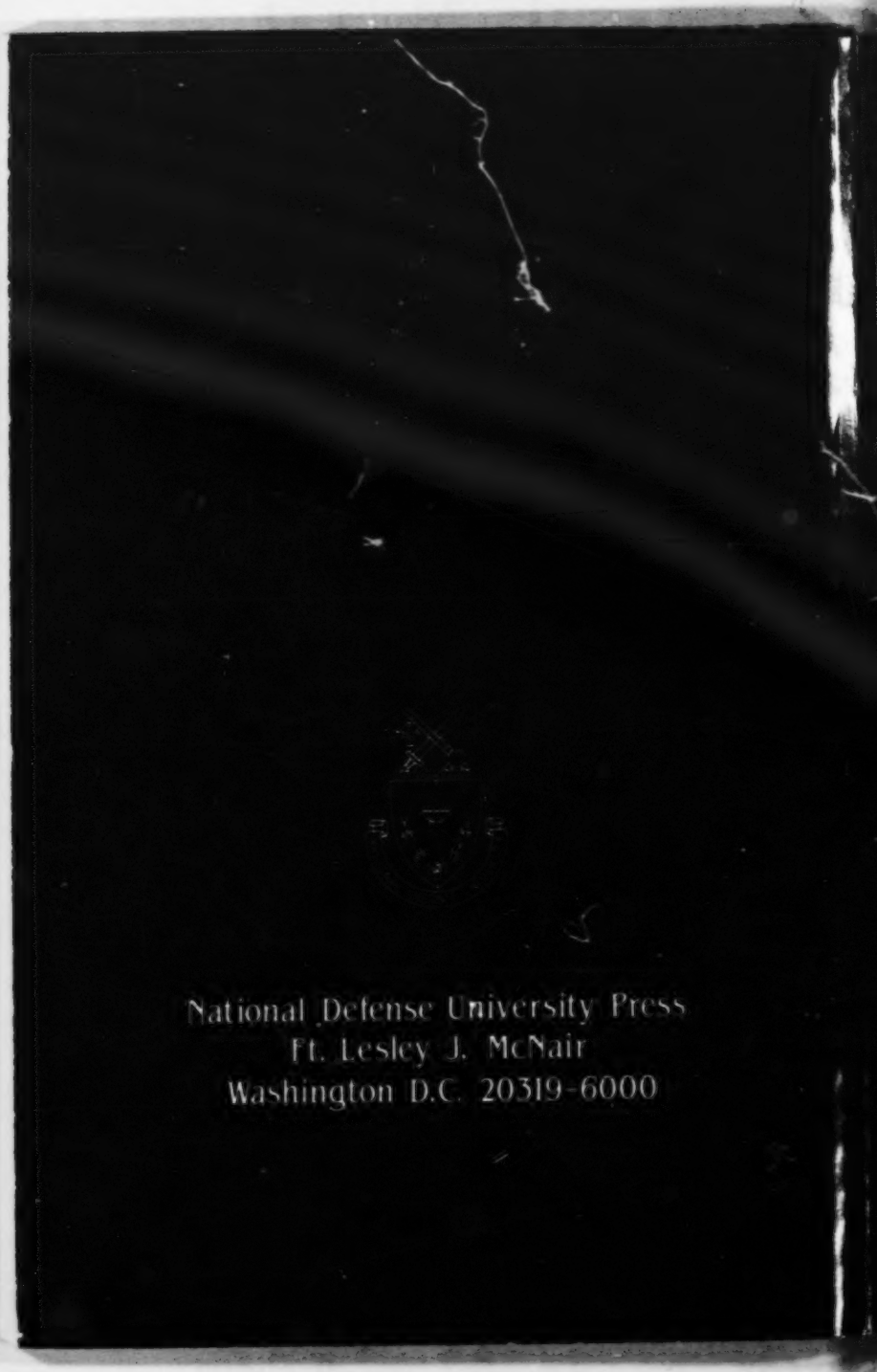

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